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EDISON ELECTRIC INSTITUTE BULLETIN

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JANUARY, 1938

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EDISON ELECTRIC INSTITUTE

STATISTICAL DATA OF THE ELECTRIC LIGHT AND POWER INDUSTRY

Compiled Monthly by the Edison Electric Institute—Covers 100% of the Industry

DURING THE MONTH OF OCTOBER

	1937	1936**	%
Kilowatthours Generated* (net)			
By Fuel	6,823,878,000	6,512,701,000	+ 4.8
By Water Power	3,085,904,000	3,083,928,000	+ 0.1
Total Kilowatthours Generated	9,909,782,000	9,596,629,000	+ 3.3
Additions to Supply			
Energy Purchased from Other Sources	282,146,000	161,703,000	+74.5
Net International Imports	90,941,000	82,869,000	+ 9.7
Total	373,087,000	244,572,000	+52.5
Deductions from Supply			
Energy Used in Electric Railway Departments	47,217,000	47,460,000	− 0.5
Energy Used in Electric and Other Departments	112,213,000	130,894,000	−14.3
Total	159,430,000	178,354,000	−10.6
Total Energy for Distribution	**10,123,439,000**	**9,662,847,000**	**+ 4.8**
Energy Lost in Transmission, Distribution, Etc.	**1,615,330,000**	**1,616,187,000**	**− 0.1**
Kilowatthours Sold to Ultimate Customers	**8,508,109,000**	**8,046,660,000**	**+ 5.7**
Sales to Ultimate Customer (kwhrs)			
Domestic Service	1,520,359,000	1,352,004,000	+12.5
Commercial—Small Light and Power (Retail)	1,551,683,000	1,370,979,000	+13.2
Commercial—Large Light and Power (Wholesale)	4,712,480,000	4,579,853,000	+ 2.9
Municipal Street Lighting	187,771,000	196,736,000	− 4.6
Railroads—Street and Interurban	355,260,000	360,839,000	− 1.5
Railroads—Electrified Steam	103,698,000	106,283,000	− 2.4
Municipal and Miscellaneous	76,858,000	79,966,000	− 3.9
Total Sales to Ultimate Customers	8,508,109,000	8,046,660,000	+ 5.7
Total Revenue from Ultimate Customers	$186,456,100	$177,392,700	+ 5.1

DURING TWELVE MONTHS ENDING OCTOBER 31st

Kilowatthours Generated* (net)			
By Fuel	74,584,523,000	67,291,801,000	+10.8
By Water Power	40,407,635,000	36,823,401,000	+ 9.7
Total Kilowatthours Generated	114,992,158,000	104,115,202,000	+10.4
Purchased Energy (net)	4,601,425,000	2,961,249,000	+55.4
Energy Used in Electric Railway and Other Departments	2,027,177,000	2,211,007,000	− 8.3
Total Energy for Distribution	**117,566,406,000**	**104,865,444,000**	**+12.1**
Energy Lost in Transmission, Distribution, Etc.	**17,602,808,000**	**17,254,370,000**	**+ 2.0**
Kilowatthours Sold to Ultimate Customers	**99,963,598,000**	**87,611,074,000**	**+14.1**
Total Revenue from Ultimate Customers	**$2,187,070,400**	**$2,021,694,200**	**+ 8.2**
Important Factors			
Percent of Energy Generated by Water Power	35.1%	35.4%	
Domestic Service (Residential Use)			
Average Annual Consumption per Customer (kwhr)	792	725	+ 9.2
Average Revenue per Kwhr (cents)	4.43¢	4.72¢	− 6.1
Average Monthly Bill per Domestic Customer	$2.92	$2.85	+ 2.5

BASIC INFORMATION AS OF OCTOBER 31st

Generating Capacity (kw)—Steam	24,160,700	24,089,919	
—Waterpower	9,609,000	9,399,586	
—Internal Combustion	678,500	614,864	
Total Generating Capacity in Kilowatts	34,448,200	34,104,369	
Number of Customers			
Farms in Eastern Area (Included with Domestic)	(879,679)	(736,398)	
Farms in Western Area (Included with Commercial—Large)	(301,371)	(270,236)	
Domestic Service	22,402,568	21,584,902	
Commercial—Small Light and Power	3,873,288	3,791,098	
Commercial—Large Light and Power	565,324	559,719	
Other Ultimate Customers	73,250	66,149	
Total Ultimate Customers	26,914,430	26,001,868	

* By courtesy of the Federal Power Commission, with deductions for certain plants not considered electric light and power enterprises.
** Revised monthly series.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 6 JANUARY, 1938 No. 1

The Electric Light and Power Industry in 1937

A Brief Review

By C. W. Kellogg
President, Edison Electric Institute

ELECTRIC power output set a new high record in 1937, exceeding that of the previous year by 8½ per cent, and reaching a total of 119 billion kwhr. This represents an increase of 28 per cent above the boom year of 1929. Production by water power was 40 billion kwhr, and by fuels 74 billion kwhr, while power imported from Canada and purchased from other sources was 5 billion kwhr.

The highest weekly production, which usually occurs the week before Christmas, occurred this year in the last week of August. This was due primarily to the industrial recession in the later months of the year, but it reflects also the influence of the large refrigeration and air conditioning load that has developed in recent years.

Generating capacity at the close of 1937 was estimated at 35,042,000 kw, of which 9,617,000 kw, or 27½ per cent, was in water power plants, 24,745,000 kw in steam stations and 680,000 in internal combustion engines. New construction during the year comprised 1,050,000 kw of additional power generating machinery, which was, in part, offset by the retirement of 268,000 kw of older equipment, leaving a net increase of 782,000 kw added to the electric utility power plants for the year 1937.

Total construction expenditures for 1937 (exclusive of Federal work) were estimated at $455,480,000, a large increase over the $289,710,000 spent during the previous year, but still less than one-half of the expenditures during the peak year of 1930. Of the 1937 total, the expenditures for distribution poles, wires and equipment again constituted the largest item, being $203,250,000 or nearly one-half of the entire amount. Expenditures for steam generating stations totaled $113,060,000 or 24½ per cent while expenditures for hydroelectric plants again were negligible, costing only $10,540,000.

Some 27,000,000 customers are now receiving electric service. This represents an increase of 794,000 during the year. Of those newly connected, about 157,000 were farms, bringing the total number of farms supplied with electricity to 1,200,000 at the end of 1937. This represents about 19 per cent of all farms having occupied dwellings and some 28 per cent of all farms which have dwellings valued at more than $500. It is estimated that existing electric power lines reach an additional 280,000 farms which do not take service, making a total to which service is available of about 1,480,000.

Sales of electricity to all ultimate consumers amounted to 99,300,000,000 kwhr compared with 90,044,000,000 kwhr in 1936, an increase of 10.3 per cent. Farm consumption increased 24.4 per cent, residential consumption 12.9 per cent and commercial and industrial use 10.6 per cent.

Total revenues from sales of electricity aggregated $2,200,000,000 compared to $2,044,500,000 in 1936, an increase of $155,500,000. The industry's consumers received 10 per cent more electricity, and they paid only 7.6 per cent more for their service in 1937 than in the preceding year.

Increased costs absorbed a large part of the increase in revenue. A substantial increase in taxes, in wages and in fuel costs was experienced. Taxes paid by power companies were approximately $330,000,000, or 16 cents per dollar of their gross revenue.

Revenues per kwhr for all classes of service were 2.22c in 1937, compared with 2.27c in 1936.

Of the total sales of electricity, large industrial and commercial users took 52,640,000,000 kwhr or 53 per cent. Small light and power customers used 18,410,000,000 kwhr, while residential customers took 16,930,000,000 kwhr.

The post-war growth of electricity used in the home continued last year at an accelerated rate. The annual use per residential customer in 1937 was 797 kwhr, or nearly 10 per cent above the 727 kwhr consumed by these customers in 1936. The annual revenue per kwhr for residence use has continued to decline to 4.37 cents, compared with 4.65 cents in 1936, or a decrease of 6 per cent, which is the average rate of decline during the past several years. At the close of 1937, the unit cost of electricity in the average home was almost exactly one-half of what it was in 1913, although the cost of living is almost one-half as much again at the present time as it was before the war.

In 1927 the average residential customer paid $30.19 for 444 kwhr. In 1937 he paid $34.83 for 797 kwhr. He is receiving 353 kwhr more per year and paying only $4.64 for it. This incremental cost to him for the additional energy is thus only 1 1/3 cents per kwhr.

Electric Company Taxes Increase by Nearly $50,000,000 During 1937

BASED upon the published statements of the companies reporting for the 12 months period ending with November 30, taxes paid by electric light and power companies have increased by almost $50,000,000, or by one-sixth, during 1937 and, for the industry as a whole, they now take nearly a dollar out of every six received from consumers.

Although all figures are subject to year-end corrections and adjustments, it is estimated that revenues from consumers have increased by some 7 per cent during 1937 while taxes have risen from 14.7 cents out of every dollar of consumer revenue in 1936 to 16 cents in 1937. The result of these two cumulative factors is that the taxes paid by electric utility companies have increased from $285,000,000 in 1936 to at least $330,000,000 in 1937.

Much of the rise in taxes in 1937 has taken place in Federal taxation which, according to the companies that have reported it separately, has increased by almost 40 per cent during the past year. In 1935, Federal taxes comprised one-third of all taxes paid by electric utilities. According to figures thus far published, Federal taxes in 1937 may total nearly $150,000,000 and comprise 45 per cent of all taxes paid.

The perpendicular rise in the taxation of private electric light and power companies is given by the following table, which shows taxes and revenues in recent years:

ELECTRIC LIGHT AND POWER COMPANY TAXES

Year	Operating Revenue	Total Taxes	Ratio: Taxes to Revenues
1927	$1,588,900,000	$150,253,000	9.5%
1932	1,738,000,000	203,858,000	11.7%
1933	1,664,000,000	215,000,000	12.9%
1934	1,736,000,000	245,000,000	14.1%
1935	1,813,000,000	255,000,000	14.1%
1936	1,940,000,000	285,000,000	14.7%
1937*	2,075,000,000	330,000,000	16.0%

* Preliminary estimate: subject to year end adjustments and for Federal surtaxes on undistributed profits, if any.

Nearly Six Dollars of Taxes Concealed in Annual Bill for Residential Electric Service

At the present rate of taxation upon electric light and power companies, nearly six dollars a year, or 50 cents per month, are contained in the residential electric consumer's annual bill for service. In 1937, taxes took at least 16 per cent of consumer revenues, as compared with less than 12 per cent in 1932 and this increase in taxation has more than offset the slight growth in the annual payment of the average consumer. Taxes excluded, the electric light and power companies receive no more money from the residential consumer than they did five years ago, although the amount of current furnished to him has increased by 200 kilowatthours a year, or by one-third. The growth in taxation as applied to residential service during recent years is shown by the following table:

RESIDENTIAL ELECTRIC SERVICE

Year	Anual Bill per Consumer	Ratio Taxes to Revenues	Taxes Concealed in Consumers Annual Bill	Net Bill Deducting Taxes	Kwhr Used per Year
1932	$33.25	11.7%	$3.89	$29.36	597
1933	32.56	12.9%	4.20	28.36	593
1934	33.07	14.1%	4.66	28.41	624
1935	33.38	14.1%	4.71	28.67	669
1936	33.81	14.7%	4.97	28.84	727
1937*	34.83	16.0%	5.57	29.26	797

*Preliminary estimate.

Reduction of 4½ per cent in Government Expenditures Would Offset Country's Entire Bill for Residential Electricity

The following table compares the total expenditures by all branches of Government—Federal, State and Local—with the total amount paid for household, or residential, electricity in the United States. A four and a half per cent economy in government would balance the entire bill for residential electric service.

Based upon the increase in Federal Expenditures, total Government Expenditures in 1936 were at least $17,000,000,000 making the cost of residential electricity 4.1 per cent of the cost of government.

GOVERNMENT EXPENDITURES COMPARED WITH COST OF RESIDENTIAL ELECTRICITY IN THE U. S. A.

Year	Government Expenditures	Cost of Electricity	% Cost of Electricity Cost of Government
1926	$10,196,000,000	$469,272,300	4.60%
1929	11,709,000,000	600,265,500	5.13%
1932	13,417,000,000	640,384,600	4.77%
1933	12,232,000,000	623,797,200	5.10%
1934	14,449,000,000	648,801,500	4.49%
1935	14,931,000,000	673,526,100	4.51%
1936	.....	696,997,400	.....
1937	.....	740,100,000	.....

Statistical Year-Book of World Power Conference

STATISTICAL Year-Book No. 2 of the World Power Conference has just been published by the Central Office of the Conference at London. The Year-Book contains statistics of the resources, production, stocks, imports, exports, and consumption of power and power sources in all the countries of the world for which it was possible to obtain information. The power sources included are coals, brown coal and lignite, peat, coke, wood, petroleum, benzoles, alcohols, natural gas, manufactured gas, water power, and electricity. The statistics of resources are the latest available, and those of production, stocks, imports, exports, and consumption relate to the years 1934 and 1935.

Most of the statistics were specially supplied by the National Committees of the World Power Conference and by Government and other organizations in the countries concerned, and conform to standard definitions which are reproduced in the text.

This publication is being distributed directly from the London office of the World Power Conference at 36, Kingsway, London, W C 2. The price in the United States is $5.00 which includes mailing charges. Orders may be sent directly to London, or may be submitted through the American National Committee, World Power Conference, Interior Building, North, Washington, D. C.

Why the Utility Construction Lag?

What Can Be Done About It?

By James F. Owens
President, Oklahoma Gas and Electric Co.

Reprinted, Courtesy of *Commerce Magazine*, Jan., 1938

THE sharp industrial and financial recession which began early this Fall jolted the nation from a complacent assumption that economic equilibrium had again been established and that we were at last on the road to sound recovery. Causes were not hard to discover. Even a casual exploration of the economy of the country revealed several sick industries—and others still convalescent, teetering near relapse. The chief invalid industry was that wide field of manufacturing we lump together as the "heavy goods industry." It was ill because of the more critical illness of its chief supporters: utilities, rails, and building.

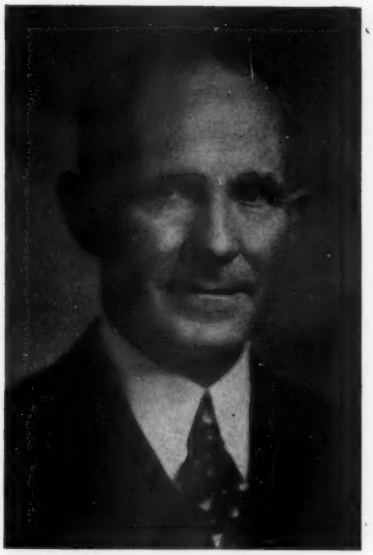
I shall leave to better qualified practitioners the diagnosis of the economic patients beyond the field of electric utilities and confine myself to the problems of that industry.

Everybody wants the answers to two questions about the utility industry: first, to what extent could it contribute to national recovery by a construction program; and, second, what obstacles lie in the way of utility expansion and how can they be removed?

The Facts at Hand

No seventh son of a seventh son myself, I doubt if anyone can prophesy wholly accurate answers to these questions. Yet a very close approximation can be reached by an examination of the facts at hand. Let us examine the construction potentialities of the power industry—always provided that the obstruction of such construction will be removed.

Frank R. McNinch, recently shifted to the chairmanship of the Federal Communications Commission from his post as chairman of Federal Power Commission, asserted at the Investment Bankers Convention in November that the private power industry could absorb $7,500,000,000 in new money for construction in the next five years. I am not aware of the source of his figures, but they must be predicated upon a most optimistic assumption of rising demand



MR. OWENS

and increased prosperity. Probably more realistic was the estimate of William O. Douglas, chairman of the Securities and Exchange Commission, who believes that the program could easily run at a billion dollars a year. On the basis of a wage of $5 per day and 200 working days per year, Mr. McNinch's sum would create new jobs for 1,275,000 workers annually for five years since government records show that such construction returns—directly and indirectly—85 per cent in wages.

Let's examine some figures. In the decade from 1923 to 1932 inclusive, the utility industry built feverishly to keep pace with a demand that compounded at 10 per cent annually. Its physical equipment, steam and hydro generation, transmission and distribution systems, trebled in that ten years. In spite of a sharp recession in the last two years of the decade, the average construction totalled three quarters of a billion dollars every year. Because it requires two years to plan and build a modern steam generating plant, the momentum of that construction swept it on two years after the 1929 demand peak. Thus in 1932 there existed generating capacity of 33,864,000 kilowatts which generated 79,692,000,000 kilowatt hours; while the then all-time peak of 1929, 92,767,000,000 kilowatt hours had been produced from a generating capacity of 29,558,000 kilowatts.

It is apparent that there was a surplus of generation reserves in 1932 and that further building was not indicated until demand improved. But that did happen soon and sharply. Production in 1933 exceeded the previous ten-year average and in 1934 barely missed the honor of being second highest on record. Production in 1935 was three billion kwhr more than the record of 1929, and 1936 was 17 billion greater than that highwater mark. Meantime, however, although production had increased 40 per cent from 1932 to 1936, generating capacity had increased but 212,000 kilowatts or six-tenths of 1 per cent. Moreover, despite the recent recession, current estimates place production for 1937 still higher than 1936.

How Many Dollars?

In dollars and cents the story is even more impressive. I have developed tables for which I am indebted to the *Electrical World* for the figures on New Money from the Investing Public, and to Edison Electric Institute, for construction statistics for the corresponding years from 1923 to 1936 inclusive. The averages, percentages, and deductions are my own.

They show that in the ten-year period prior to the present Administration—including the two subnormal years of 1931 and 1932—the investing public has poured into the industry some $6,755,000,000, an average of $675,500,000 annually. And the industry from its own company funds—retirement reserves, holding company advances and undistributed earnings—contributed an additional $766,000,000 or 11.3 per cent, for a construction total of $7,521,000,000.

But in the first four years of this Ad-

ministration the investing public averaged but 3.3 per cent of the ten-year normal, or $22,750,000 annually. Meantime the operating companies fell back upon company funds as above described for construction money. From this source almost alone, they were able in four years to build as much as they had formerly constructed in one normal year. Where but 11.3 per cent of their building funds had formerly come from this source, it now averaged 733 per cent greater than money invested by the public.

Thus, since the normal annual average of newly invested money was $675,500,000, normal investment from 1933 to 1936 inclusive should have been $2,702,000,000. This means that an assumed deficit of some $2,611,000,000—the "normal" potential investment of those years less the $91,000,000 actually invested—was accumulated during the period. Statistics for 1937 are not yet available, but nothing has occurred that would have materially altered this trend.

Back of the Power Shortage

How much of a power shortage there is now or may soon exist nobody really knows or can safely guess. But that a large shortage impends unless building is begun at once requires little proof.

Put it this way: if I were president of all the electric utility companies of the nation, I should at once launch a four year building program of not less than four billions dollars. That would be a conservative plan. Having supplied the answer to the first question, let us now turn to the problem of how to get that great private building program under way. To those who have been intimate with the utility industry over the past five years the answer is simple, but it may be less easily understood by the uninformed. The public is vaguely familiar with such phrases as "death sentence," "subsidized competition," "direct competition" and the like although I doubt if the significance of them is very generally understood.

But the source of any new utility money is vitally aware of the importance of these words. That great mass of individuals who hold small sums—in aggregate a huge amount—which they seek to invest safely, the investing public, is now rounding out the fifth year of an "investors' strike" against the power industry. I can now hear somebody on the rear pew heckling me with "How-about-Insull!" inferring that the cause of this avoidance of the industry has been due to alleged financial abuses of the industry in the past. That is not a true or fair inference. But for factors which I will suggest the utility industry today would be the safest as well as the most lucrative investment available. Because of those factors, however, soundly financed and operated companies that have not missed a dividend in a generation today are selling at a ratio of eight to twelve earnings (thus a stock yielding $1 annually may sell from $8 to $12). Utility earnings dropped least and rose soonest during and after the depression. Because of the nature of the industry, many investors regarded their stability as a form of guaranteed earnings.

Yet nobody wants utility stocks—at least the demand is so weak as to force existing issues to new lows. True, it has been possible in some instances to refinance underlaid obligations, amply overlaid by a protecting cushion of common and preferred stocks. But "junior money," the equity or common stocks, necessary to cushion bonds, just can't be raised these days. To raise a billion in common stocks, a quarter of a billion in preferred stocks, and half a billion in bonds—that is the usual ratio. We can't sell the bonds without the protection of preferred and common. And we can't sell the preferred without the cushion of common. And we can't sell ANY common.

That's the dilemma.

Why Stocks Can't Be Sold

And why can't utility common stocks be sold, in the face of prospective rich earnings and heavy power demands? Broadly speaking the answer is found in the Federal power policy. Investors won't invest in an industry whose competitor is Uncle Sam. They feel that Uncle Sam's competition, tax free, unhampered by fear of loss and hope of profit, can lick any private company. Many of them think that the present threatened power shortage was deliberately created to justify further federal power building and competition—perhaps leading to complete nationalization by competitive destruction.

Investors won't put new money into the industry until they are assured that its richest markets will not be destroyed by erection of publicly owned plants made possible by free gifts of 45 per cent of the cost from Uncle Sam's capacious tax reservoirs (to which they must contribute). And they won't invest in an industry over which hangs by a legal thread the sword of demoralization, and disintegration by federal law. I refer to the "death sentence" in the Public Utility Act of 1935 which, if proved constitutional, might break up and destroy some of the soundest and most progressive utility systems of the nation. And, when talk of inflation is in the air, investors will not invest in an industry whose earnings will be regulated on the basis of "original cost," rather than "fair reproduction value"—as now proposed by the Administration.

In fact, I have been informed that there exists a deeply grounded and widespread belief among many thoughtful investors that the threatened power shortage and the current utility distress have been deliberately induced by policies of those influential with persons high in the government. It is the belief that an attempt has been made to create an artificial shortage of power to justify further federal power construction leading to eventual nationalization of the industry.

Bankers' Report

On this point a special report of the Investment Bankers Association last month stated:

"There is no money for increased capacities where competitive projects have been undertaken or where government threats exist, and a condition will not be long in the coming, engendered by the repressive acts of the government, which will soon give it the opportunity to claim that it alone can make good a threatened shortage in capacities in the private plants—a condition created by this collateral and cumulative influence of government threats that put industry in the wrong and gives the government the opportunity to pose as a savior."

Let there be no misunderstanding: this is an investors' "sitdown strike" as it were; definitely it is NOT a matter within the control of managing executives. If they had their way they naturally would respond to increasing demand with increased facilities. The sole reason utility executives have not kept pace with new power demands is the impossibility of raising new money with which to build.

These, in general, are the chief sources of investor fear which must be removed if a great construction program is to be launched. They could be removed in ten days by simple acts of Congress and by the President. But they would require so sharp a reversal of policy that only great statesmanship could rise to such opportunity.

How Can Government and Business Work Together?

By Wendell L. Willkie
President, The Commonwealth & Southern Corporation

From a joint debate between Mr. Willkie and Robert H. Jackson, Assistant Attorney General of the United States, under the auspices of America's Town Meeting of the Air. Broadcast from The Town Hall, New York, Jan. 6, 1938. Copyright, The League for Political Education, Inc.

I WONDER if it seems strange to any of you tonight that we should be discussing the question of whether or not the government should cooperate with American business. I have an idea that if, from the town meetings of the past, our forefathers should arise to attend this meeting, they would be a little puzzled by such a topic. They might ask, with some surprise, if it was not the function of American government to encourage the development of private enterprise. They would, of course, first be astonished that such a town meeting as this was possible at all—that several million people, from all over the land, should be gathered together by means of the mysterious network of the air. They would want to be told about this big business of radio manufacture which in fifteen years by large scale production has cut the price of its product by three-fourths and sold it to nearly 25,000,000 families. And after they had learned about these things, they would, I think, be even more puzzled as to why, over the facilities made possible by American business genius, we should be discussing whether or not American business, big or little, should be encouraged to proceed.

For several years now we have been listening to a bed-time story telling us that the men who hold office in Washington, are, by their very positions, endowed with a special virtue, that they are men of far vision, and of exceptional ability and capacity. Business men, on the other hand, particularly so-called big business men, are pictured as the ruthless dictators of sprawling industrial empires with no real ability except the talent for collecting money for themselves.

Now, most of you who are listening to this broadcast tonight will remember Joe or Tom or Dick or someone else who left your town and went to the city and made a name for himself in business. Most business leaders today were just such small town boys. You will remember also other Toms and Dicks and Joes who went into local politics and then into Federal politics, perhaps into one of the many new administrative bureaus in Washington today. On the basis of your own experience, which of these, the business man or the man in politics, wears the longer horns or sports the whiter wings? Would you, from what you know personally, consider the politician to have the greater ability and the more noble character? I tell you quite frankly that I find no halo on the head of either. I have known men in government who were excessively greedy for power and I likewise have known men in business who were excessivly greedy for money. But this is not typical of either group, and whatever other monopolies Mr. Jackson may claim to find, I know he has not found, even among government officials, a monopoly on virtue.

MR. WILLKIE

But there is another myth that has been handed out to us in recent years, and that is that big business and small business have different and opposing interests. My distinguished companion on the platform has made this a favorite theme of his many speeches. He has warned against government cooperation with big business, maintaining that, to quote his words, "the governmental cooperation which the small business man wants is a different kind."

The fact of the matter is that small business and big business prosper under exactly the same conditions, and the conditions that are harmful to one are harmful to the other. In fact, small business suffers more acutely from such things as heavy taxation, government hostility, and timidity of investment, because it has no reserves with which to preserve itself in time of adversity. Big business supplies a market to small business not only by buying its products but by stimulating the general market; moreover, it furnishes small business with low cost materials and supplies. The two are dependent, one upon the other. When we say that American industry is prosperous, we mean that the small businesses of America, which comprise the larger part of our industry, are prosperous.

After all, a large corporation is simply a corporation in which as a rule the interest is divided among a great many small stockholders. If government succeeds in destroying a large corporation, more people, both stockholders and employees, suffer at one time, that is all. It is not the size that makes a corporation bad or good; it is the way it operates. For example, the Government has been currently investigating most of the major industries of the country such as the oil industry, automobiles, telephone

and telegraph, utilities, and railroads. These are typical big business industries. What have they achieved? Do they make a good product? Is it sold at a fair price? Does labor receive a fair wage?

Well, every American working man knows that the highest wages and the best working conditions are found in the large corporations. If the wage and hour bill is passed, the effect on America's big business corporations will be negligible because their wage levels are already above the minimum suggested in the bill. Also, it seems a little ironical for government officials to be lecturing big business on the desirability of low price and large volume because this was the technique which was developed and made possible only by mass production and distribution under the leadership of big business.

The oil industry, for example, is one in which there are a number of very large companies of the kind Mr. Jackson dislikes. Yet anyone who has driven a car abroad knows that the system of service stations which we take for granted here is duplicated in very few places outside our borders. Although nearly half of what we pay for gasoline represents the government tax, we can still buy it for less than in almost any other place in the world. And, of course, no country pays refinery workers as high a wage as they receive here. In fact, the average hourly wage rates in refineries have increased more than 50 per cent in the past fifteen years while the gasoline price, excluding the tax, has declined by nearly the same amount.

More than 50 per cent of all telephones in the world are in the United States, and they cost the consumer a smaller part of his income than anywhere else.

During the four years ended in 1932, the American automobile industry lost 80 per cent of its business. In one year the industry's net loss was half the cost of the Panama Canal. Yet during that four-year period the industry made a low priced car which was better than the highest priced car in 1926. The public got a better car for considerably less money; and the reduction in price did not come out of the pockets of labor because automobile labor continued to be among the highest paid of all manufacturing industries. Here again, it was big business that made the achievement possible. At a press conference in 1936, President Roosevelt quoted with approval a remark made by Walter P. Chrysler, stating that because of the efficient production methods made possible by the big automobile companies we could buy a car for $600 today which otherwise would cost $3,500. The President stated at that time that the same methods should be applied to the housing industry.

Of all the industries mentioned, the utility industry, with its enormous demand for additional construction and equipment, is the most important to our economic recovery. And how has it been operated? Since the pre-war years the cost of living has gone up about 40 per cent, and the cost of electricity in this country has gone down by almost exactly the same per cent. *The American consumer pays a smaller part of his income for electricity than the consumers in any country in Europe.* On an average, the American pays nine cents a day for electricity or less than the government tax on a package and a half of cigarettes.

Since Mr. Jackson has at times employed the usual government argument against the utility holding company, perhaps we should note here that electricity costs less when it is supplied by one of the great utility holding company systems. In every one of the forty-eight states of the United States, you will find in operation both the so-called independent utilities which are unaffected by the death sentence of the Utility Holding Company Act, and the utility companies affiliated with holding companies. In forty-four of those forty-eight states the rates of companies in holding company systems are lower than the rates of the independent companies.

No doubt there have been weaknesses and abuses in all the industries mentioned, and in others, too. Betrayals of trust have stained the record of public officials as well as of business men. In the period following the great war there was a break-down in both government and private morals. For the first time in history a member of the Presidential Cabinet was sent to the penitentiary. Some of those who were in charge of the hospitals for America's war veterans were indicted, and some convicted, for stealing the very blankets and towels provided for the care of these men who were injured in their country's service.

Speaking of abuses in his relief program, President Roosevelt stated: "It should be remembered that in every big job there are some imperfections. There are chiselers in every walk of life, there are those in every industry who are guility of unfair practices, every profession has its black sheep . . ." If this quotation from President Roosevelt represents what our attitude should be toward the mistakes of the few in government—and I think it does—then that should also be our attitude toward industry. In view of the friendlier tone of the President's last speeches, I hope that at last we can have done with the epithets, the calling of names, the catchwords—catchwords which have been so glibly used, such as "economic royalists," "Bourbons," "moneyed aristocrats," "banker-control," "holding companies," and the nonsense about "sixty ruling families."

"A good catchword," Justice Oliver Wendell Holmes said, "can obscure analysis for fifty years." Today we are very much in need of analysis without catchwords. The business decline has become so serious that government officials, who at first sought to minimize it, are now seeking frantically to make big business responsible. Some of these officials allege that the present slump was caused by a few business "strong men," who like Samson, were willing to destroy themselves in order to pull down the house. They would have us believe that the automobile companies are deliberately trying not to sell cars. They would have us believe that the steel companies which were operating at 90 per cent of capacity are now purposely losing money and operating at 20 per cent of capacity and that they increased their prices for no reason, whereas, in fact, these prices increased less than wages and cost of materials.

However absurd this charge may be, I see no point in arguing it. I suggest that we have now reached the time when we should stop discussing what caused the depression and should direct our attention to how to cure it. The real cure consists in convincing the millions of small investors throughout America that the government does not intend to continue its attack on American industry, big or little, for it is these investors upon whom industry depends for its funds.

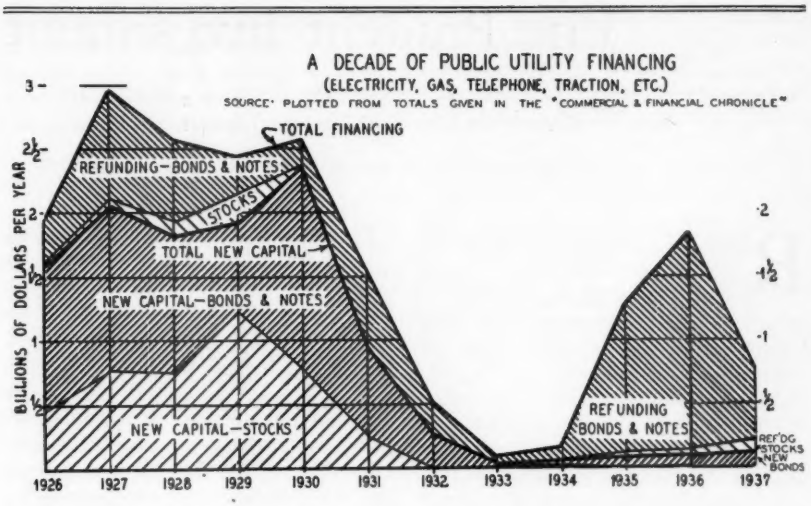
For instance, the utilities need to spend several hundred million dollars for new construction, but they can only raise the money by selling securities. The investor will buy securities only if

he thinks that he will get a safe and fair return. He knows that the Government is now competing with private industry in the Tennessee Valley by selling electricity at less than cost and charging the loss to the Federal Treasury. He knows that the government is giving money away to municipalities to duplicate existing distribution lines. And he will not invest his money in utilities merely because some one says that the Government is competing in only 15 per cent of the country's area.

If there is a small-pox epidemic in a city you cannot convince a man he is in no danger because at the moment only 15 per cent of the city is affected. The investor knows that if the Government can compete in 15 per cent of the United States it can compete with any industry, anywhere, and he is not reassured by government efforts to belittle or conceal this competition.

Mr. Jackson has previously spoken of a "strike of capital" against the Government. If there is any strike of capital it comes from these millions of small investors, not from the wealthy few. As a matter of fact, due to the income tax laws which take up to 83 per cent of a rich man's investment in private enterprise, most of the very rich have been investing more and more in the flood of tax-exempt government securities. It might be helpful to industry, as well as to government revenues, if the Government should remove these tax exemptions; but this in and of itself would not be enough. The main problem is to restore the confidence of investors in American business, and to do this will require more than pleasant speaking on the part of Government. For several years the Government has taken definite action to show its hostility to business. It must now take definite action to demonstrate the sincerity of its desire to cooperate.

I don't think that such cooperation should be difficult. The chief reason why government officials and business men fail to understand each other is because one thinks and speaks the language of politics and emotionalism, while the other thinks and speaks the language of economics and realism. One thinks economic forces can be controlled by politics while the other realizes that economic forces are more powerful than either government or business. But if we look behind this difference in theory, we can find much upon which we agree in practice.


A DECADE OF PUBLIC UTILITY FINANCING
(ELECTRICITY, GAS, TELEPHONE, TRACTION, ETC.)
SOURCE: PLOTTED FROM TOTALS GIVEN IN THE "COMMERCIAL & FINANCIAL CHRONICLE"
BILLIONS OF DOLLARS PER YEAR
TOTAL FINANCING
REFUNDING—BONDS & NOTES
STOCKS
TOTAL NEW CAPITAL
NEW CAPITAL—BONDS & NOTES
NEW CAPITAL—STOCKS
REFUNDING BONDS & NOTES
REF'DG STOCKS
NEW BONDS
1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937

For example, there seems to be no important disagreement today on the need for a reduction in the undistributed profits tax and the capital gains tax, both of which fall with particular severity upon small businesses and both of which restrict the expansion of industry.

Nor is there any general disagreement as to the principles of the social legislation which has been put upon the statute books in recent years. Time has revealed both the virtues and the weaknesses of these laws. The proposal now is simply one of eliminating the weaknesses; of modifying those restrictions upon the buying and selling of securities that hamper the investment of funds; of readjusting the Social Security Act to a pay-as-you-go basis, so that the money paid by the people for social security is used only for that purpose; of protecting the rights of both capital and labor in the promotion of collective bargaining; of getting rid of intermediate holding companies in the utility industry without declaring a "death sentence" upon all of them.

Six weeks ago I left with the President a memorandum suggesting a solution of the utility problem—a solution which did not ask for less Federal regulation of utilities, but did ask for an end to unfair government competition and unfair government destruction of the property of American citizens. I am still hopeful that that memorandum will provide a basis upon which the utilities may be permitted to go ahead with their construction plans.

Now, is there anything in this outline of a possible relationship between government and business that is not in the interest of the ill-housed, the ill-fed and the ill-clad? Is there anything here that is opposed to the social regulation of business? Does this attitude imply that business is "ganging up" on government, or that a few corporations are attempting to swallow up all American industry?

In such a time as this when we see the relief rolls lengthening again and the price of farm products declining, when many of us are discouraged and when the road to recovery seems long, surely business and government should put an end to the bitterness of recent years and sit down in conference like reasonable men with mutual tolerance and respect. But the purpose of this conference must not only be to plan intelligently for the future, but to review those laws which have been passed—to see whether they cannot be so modified as to stimulate business activity, without removing any of the appropriate social controls. And above all, while these conferences are proceeding, the American people should be spared the confusion of hearing what one government official says in friendship today denied by another in hostility tomorrow.

At this critical point in our nation's history, it would seem fitting that business and government should bear in mind the warning which Abraham Lincoln gave to the two factions into which this country was dividing at the time of his first inaugural address. "I am loath to close," he said, "we are not enemies, but friends. We must not be enemies."

The Prudent Investment Principle

By John T. Madden

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An address before the Economic Research Round Table Bankers Club, New York City, Dec. 14, 1937

RECENT discussions of public utility problems have again brought "prudent investment" into prominence as a measure of value for rate making. President Roosevelt has indicated his adherence to this principle. A leading executive of the industry recently indicated his willingness to accept this measure of value for rate making, but with the qualification that it be applied as an exclusive evidence only to future additional investment, and that the present fair value principle continue to apply to the existing investment. He also questioned whether prudent investment would actually operate to the advantage of the consumer.

Since it is not impossible that mutual acceptance of this principle for rate making may be part of a "truce" or "treaty of peace," which will conclude the "warfare," of our government against the utility industry, some consideration of the nature and consequences of a change from the principle of fair present value to prudent investment is in order.

The present rule of rate making has long been subject to criticism from economists, legal philosophers, regulatory authorities, and practical businessmen. Justice Brandeis said the present rule of fair value is legally and economically unsound. Other Justices of the Supreme Court may hold similar views. It is not impossible that the Court may at some time reverse itself or depart substantially from the rule that rates must yield a fair return on the present fair value of property used and useful. The importance and timeliness of the topic warrants much more consideration and attention than we can give it here, and my effort is subject to all the limitations of a brief discussion.

There is much about this conflict of methods of rate base determination that can only be understood by reference to the historical origins of the issue. Even more important is the clear understanding that some of the arguments reflect selfish interests and desires, while others raise fundamental issues of social economy and welfare. To further confuse and confound the ordinary citizen and others, the socially vital consideration sometimes operates in favor of one side and then again in favor of the other. A sound argument may thus be offered because it serves a selfish interest. I am unable to overlook the economic soundness of a policy because at one time it may operate in favor of private enterprise, and to favor an unsound consideration because at the time it may serve the selfish interest of the consumer. To a considerable extent this sort of opportunism has characterized the conflict over principles of rate base determination. The argument supporting a selfish interest favors whatever principle would at the time give the result desired, in the case of consumers the lower base, in the case of the producers the higher base. The only improvement on this which has come to my attention is the proposal of Senator Norris that the rate base be determined by cost or cost of reproduction, whichever at the time is *lower!* As yet, no one from the industry has as frankly proposed "Cost or Cost of Reproduction, Whichever is Higher." An objective evaluation of the economic merit of the prudent investment standard can not clearly give consideration to the fact or argument that it will result in lower rates or higher rates, as the case may be. Unfortunately, the issues involved have most frequently developed in the course of rate litigation in which each party in pursuit of its maximum selfish advantage has pressed for the support of principles which favored its cause. Unfortunately also much of the incidental literature bearing on the controversy is tinged by the interest of authors in "bringing rates down" or "defending the level of rates."

There is a third interest in the method of determining the rate base for public utilities which I also consider, in part at least, selfish. Regulatory authorities have favored prudent investment because of the alleged ease, speed, and simplicity of administration. These ends have much to commend them but insofar as they come in conflict with far more vital economic considerations, they must be viewed as a selfish interest and subordinated. Fundamental economic consequences are of more concern to society than making the job of regulation easier. A dictatorship "has it all over" representative government and legislative assembly in this respect.

The controversy over the methods of rate base determination is of long standing. Toward the end of the third quarter of the 19th century, our railroad utility industry was subjected to much the same sort of attack as other utilities have more recently faced. This has never wholly subsided and the results are with us today. Railroads were early recognized as affected with a public interest and their rates were subjected to state control under the general police power. In some instances, legislatures fixed rates that were considered confiscatory. The owners of the properties sought relief contending that the enforcement of the rates would constitute the taking of property without due process of law—a power forbidden to the Congress by the Fifth Amendment and to the states by the Fourteenth Amendment. We shall omit a recital of the steps by which the Supreme Court developed our Constitutional law on this subject. Suffice it to say that the law as it stands today was developed on a case involving maximum railway rates fixed by the legislature of the State of Nebraska decided in 1898 by the Supreme Court. In this case of Smyth v. Ames, the Court said in part:

> We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in the permanent improvements, the amount and market value of its bonds and stocks, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On

the other hand, what the public is entitled to demand is that no more be exacted from it for the use of public highway than the services rendered by it are reasonably worth.

In the course of time, as other cases came before the Court, the value doctrine was refined and clarified, but the Supreme Court has always insisted that the determination of fair value was not a matter of formula; that it must take into consideration the various evidences of value mentioned in Smyth v. Ames and other cases; that each should be given weight appropriate to the circumstances, and that fair value was present value.

The decision in the case of Smyth v. Ames, handed down in 1898, came at a time when there was probably less inflation in our economic system than ever before or since. The year 1895 marked the end of the long decline in prices which followed the Civil War, and that pattern followed very closely the pattern of the deflation which followed the Napoleonic Wars. To a certain extent already the post World War period exhibits a similar pattern. Whether or not the final pattern of the present cycle will be similar to the two long-term cycles which preceded it, remains to be seen. The world is facing new conditions in this cycle such as managed currency and regimentation, which introduce elements of great uncertainty. In any event, when the Supreme Court was called upon to face the problem in the case of Smyth v. Ames, there was no uniform system of accounts for our railroads, nor in our utilities. It is probably true to say that the books of account of those days included all sorts of errors of omission and commission because accounting processes and procedures were not well understood and had not become standardized. Proper distinctions were frequently not made in the accounts between capital and revenue charges, and it is probably true that extravagent expenditures had, in some instances, been loaded into the capital accounts. So that even if it had been desired at that time to accept the prudent investment-standard, it would have been practically impossible to determine the amount. It is also appropriate to recall once more that when the case was tried the industry contended for the investment standard, while the state asked for consideration of the cost of reproduction. To find the state favoring cost of reproduction in 1897 is as natural, as it was to find industry favoring consideration of cost of reproduction when the price level rose during the first quarter of the 20th century. It is almost a certainty that should the price level decline significantly there would follow a clamor for consideration of cost of reproduction.

There are many who forget the fact that some of our modern and well established industries rendering services which we have now come to regard as essential were, in the beginning, highly speculative ventures. For example, it was not easy at the outset to raise capital for the organization and development of our telephone industry. It was equally difficult to raise capital for the development of our electric light and power industry in the early days and not easy in any sense until the post World War period. We are familiar with the risks undertaken and the losses sustained by those who made investments in our steam railroads and our street railways. Tremendous losses were incurred by the pioneers in the motor industry, by those who pioneered in the development of moving pictures, and there was a time when the bonds of the ferry companies operating in the harbor of New York were considered prime investments for trust funds. If no chance for compensation had been provided for investors who undertook the risk involved in the development of a new industry, our material progress and standard of living would not be what it is today. Society must be willing to pay something for the risks taken by these ventures, or the risks will not be taken. There is, of course, always a possibility that society may be asked to pay too high a price for this risk taking, but I think it may generally be said that on the whole, these matters work themselves out at the lowest cost by the normal operation of economic experience. It is not the average return which capital earns in a given line that affords the great inducement to invest, but *the chance of making* a larger return. Certainly I do not know of any formula for risk taking that we could apply universally in view of the number of and character of the intangibles involved in most situations. In a country where savings and capital are relatively small or scarce, as they were in this country during the initial period of the development of the electric light and power industry, a higher price has to be paid for capital than would be the case today when we are a capital rich country with a plethora of funds looking for investment outlets or speculative opportunities. In reaching an ultimate decision as to the principle to be employed in the future for rate making, we should not condemn out of hand a plan which has produced eminently satisfactory social results, nor should we abandon one plan in favor of some other program unless we are certain that society will ultimately benefit by the new plan.

The present rule of valuation is criticized by the proponents of prudent investment as uncertain and inconclusive, since the Court in its opinion has never defined "fair value," and as administratively and economically undesirable because of the delay, the expense of determination and the temporary usefulness of the finding.

Much of the case for "prudent investment" and against the "rule of fair value" is based on misinterpretation or misrepresentation of the nature of the fair value principle and a failure to understand or recognize that (1) many of the undesirable features of past administration of the rule of fair value are avoidable without doing violence to the principle under which the electric and other utility industries have grown; and (2) that the substitution of "prudent investment" for "fair value" by no means solves the problem of rate base determination.

The most common misconception or misinterpretation of the rule of fair value is to identify it with cost of reproduction. The Court has said that fair value is *present value* but the present value of goods, particularly long-lived goods, is often not equal to their cost of reproduction or even cost of reproduction less physical depreciation; at times the value of goods may exceed cost of reproduction and some goods cannot be reproduced. There is no evidence that the Court ever fell into the error of identifying *fair value* with any of the *evidences of value,* such as original cost or cost to reproduce. The very nature of value and the necessarily changing relative significance of the evidences of value makes further definition of "fair value" *undesirable* and *impossible* for general purposes. The Court has always indicated its interest in and willingness to recognize all evidence of value, or to be more exact, has insisted that regulatory authorities give consideration to all pertinent evidence in determining a rate base.

For almost forty years, the "fair value doctrine" has been the principle under which the electric light and power industry has developed. During that period, a great industry was created which rendered an essential service to the American people at constantly decreasing costs. This service was extended to many hundreds of small hamlets which had never had, and do not have today, the common necessity of railway service. The industry was built up under economic conditions of widely fluctuating character, at rates of return which have until recent years attracted capital to the industry in adequate amounts. The investment experience of security holders of electric operating companies has been excelled by those in no other important industry. Perhaps an equally impressive record might have been made by the industry under some other legal philosophy or some other principle or theory of rate making, but the burden of proof is, of course, upon the opposition; it cannot, in the nature of things, prove its case. It is true that the legal philosophy under which the industry has developed in the United States is different from that in any other country, but it is also true that the development of the electric light and power industry here has been unequalled anywhere else. Even though Justice Brandeis, and those who follow his philosophy, may today regard the rule of Smyth vs. Ames as legally and economically unsound, yet the economic and social results which have been attained in the development of the industry speak most eloquently for themselves. As we survey the excellent operating conditions of the industry today, we must not forget that it was not always as prosperous or as efficient. Even as late as 1906, there were hundreds of local companies poorly managed, verging on bankruptcy, if not already in receivership, rendering inadequate, intermittent, or incomplete service at relatively high cost. Obviously, the history of the industry is not free from some abuses incident to all human effort, and although these abuses may be painted in the most lurid pigments for political propaganda purposes, they cannot overshadow the remarkable achievements which the industry has accomplished. Certain specific examples of abuses are often mentioned as though they were universally characteristic. For example, untrue statements as to the amount and character of write ups, or as to the investor's experience are too often made. Analysis has shown that it is necessary to season all of the allegations with large doses of salt, or to suspend judgment on the so-called "facts" which have been developed in ex-parte proceedings. In any event, the absence of a formula, or the failure to define "fair value" into a rigid impractical form, do not seem to have interfered with the provision of a high class of service at ever lower cost to rate payers and all with exceptional results for the investors in the securities of electric utility companies.

It is my reasoned conviction that the decision of the United States Supreme Court in the case of Smyth vs. Ames has come to be one of the wisest decisions ever made. Even though the determination of fair value has, in the past, been accompanied by a considerable amount of attendant expense, and in some cases, by what seemed to be interminable delay, yet that cost, whatever it may finally have amounted to, seems to have been justified by the results attained, and to have been relatively small in comparison to the revenues and capital of the industry. Efforts to establish prudent investment will also be tremendously expensive and will give rise to equally protracted litigation.

Capital in sufficient volume to meet all requirements was attracted to the industry up to and including the year 1932, with the exception of a brief period during the War when costs of operation went up far more rapidly than rates. The threat of punitive political action is probably today all that stands in the way of a resumption of capital investment on a large scale. The investor wants a fair deal from the New Deal. Marvelous technological advances have been made during the period, as the facilities were made available throughout the length and breadth of the land. As experience over the years taught us many things, we began to develop a more efficient system of state commission regulation, a better acquaintance with the problems involved. As we worked out improved methods of solving those problems, an increasing number of rate controversies were settled by negotiation rather than by litigation. In fact, a very small proportion of all instances of rate regulation are ever carried to the courts and very few become protracted and ever reach the Supreme Court. It may possibly be that the state of the industry is now such that we can proceed under a new plan of rate making for the future. But our problems should not be solved solely from the standpoint of the rate payer. We do have certain moral obligations to security holders who invested their money in good faith under a well-established theory of rate making.

Prudent, or reasonably necessary investment, does not purport to be present value. It may be higher or lower than present value, depending on the general level of prices and the rise or fall in the real (purchasing power) value of particular items of property. The necessary facts are to be obtained from books of account. Now, it may be possible to obtain investment or cost from books of account, someone's books of account if still in existence, but "prudence" is not recordable as is cost. The expense of determining original cost or investment for all utilities may well exceed the expenses of administering the rule of fair value in the relatively few instances in which the issue is contested. Certainly, for many commissions the adoption of the original cost or prudent investment requirement has or will increase their labors, rather than decrease them, and increase their budgets also.

Another misimpression which has come to prevail with respect to the original cost or prudent investment substitute for "fair value" is the belief that it is in accord with economic principle. Nothing could be much further from the truth. The economist understands the difficulties and dangers of attempting to keep public utility rates on levels out of harmony with price levels in general. He appreciates the economic undesirability of rigidities in price levels. Economics gives us the basis for understanding that if the artificial level of prudent investment is higher than value, capital will be unduly attracted and if lower, it will be unduly discouraged, and that in the face of an expected rise in the price level, it will be necessary to offer an inducement in the rate of return to offset the appreciation which capital expects and can get in other lines. Economics also affords us a basis for understanding that no regulatory authority is in position, or can in the absence of a totalitarian control over all alternatives, protect a utility in a fair return on prudent investment when and if that is above present value. An increasing proportion of the electric business is distinctly competitive and must be priced competitively. These rates must be free to follow the price of alternatives. Utility industries represent

such a volume of buying and selling that the introduction of such artificial stability into an unstable economic society could not but work out in an undesirable distortion of real costs and real incomes.

It may also be expected that the controversy which will arise as to the meaning of "prudent" will subject the investment standard to all the disabilities to which the world "reasonable" or "fair" subjects the value standard. There is no doubt but that the prudent investment standard has a decided appeal since in essence it relates to "cost" which is more objectively determinable than value, but that simplicity is, it should be understood, purchased at a cost of economic rigidity and distortion which will not hold in case of any wide departure of investment from present value.

A prudent investment standard would obviously affect different groups in various ways. The property built at a low price level would appear at a great advantage in rate comparisons with a property newly built. Under high cost conditions a company which expanded in a high price period would be on a difficult basis of comparison with one which expanded under low cost conditions. Investors in properties which have been bought and sold under the long-established fair value rule, with commission permission or even approval as to price, against which securities have been issued with permission of the commission, which securities were purchased by investors upon the assumption that rates and earnings are based on fair value, would obviously be discriminated against under any retroactive application of a new rule of rate making. The proposal to make the use of prudent investment non-retroactive is therefore only fair and decent treatment for the past investor.

Some of the economic distortion which prudent investment would create could be alleviated if, under commission control, the rate of return were so administered as to provide the equivalent of the old rate of return on an appreciated base, in the form of a proportionately higher rate of return on a rigid rate base. If the investor felt he could depend on it, this might offset his hesitancy to invest in a fixed value asset in the face of rising prices, that is, a depreciating dollar.

If prudent investment becomes the rule, obviously the first step will be to ascertain the cost of existing plant as shown by the books and records. In the case of property constructed by the utility, there should be no difficulty in arriving at its cost, but the best records, as well as others, must be checked and this is costly. Presumably, there should be no question as to whether such an investment was prudent, but there is the possibility that this question will be raised here. For in many cases, the construction was undertaken by an affiliated engineering or construction company which was a subsidiary of the same holding company as the operating company. If the plant was constructed at a profit to the construction company, an opportunity is afforded to object to the amount of the profit or to allege that the construction work could have been done more economically if the contract had been let by open bidding.

In case of property acquired from a predecessor company, it may be that the present owner acquired the property at a price based on the earning capacity of the former owner, and that the present owner paid something for intangible or going concern value. If the transaction was at arm's length, there would not seem to be any rational objection to the price paid for the acquired property. But who can say? For there will undoubtedly be some who will urge that the investment was not prudent, or that the price paid was too high, or that the earning capacity on the basis of which the deal was made arose through the allowance of an excessive rate of return, or that the price paid was far too great when the actual construction costs are taken into consideration. Or it may be alleged that the commission or the court in determining the prudent investment should ascertain the cost of the property when first devoted to the public use by some previous owner once or twice removed. In other words, is prudent investment in the case of acquired properties to be calculated on the price paid either in cash or securities by the present owner—which is cost to him—or upon the cost of the property when first devoted to the public use? Presumably these and other questions must be settled either by legislative enactment or by contractual agreement with the utilities if the prudent investment basis of rate control is to be established.

There are, furthermore, elements of value which the courts have definitely recognized that are not indicated by the record of prudent investment or original cost. The element of going value, in its best and legally approved sense, is an illustration. No determination of first cost will establish the value of a going concern over the value of the bare "units of property." The use of any objective measure for rate purposes would have to exclude such elements from consideration or else we must understand that even after prudent investment or first cost have been determined, we still must determine value, that is, make a valuation of other elements not recorded in the form of investment or cost.

Since the fair value principle is now the law of the land under the interpretations of the Supreme Court, the Court would have to distinctly alter its opinion and reverse a rule of over forty years standing. No one can foresee the effect which such a reversal would have upon investments or upon the market for future capital issues. It is evident that the prudent investment principle would, within narrow limits, be beneficial to bondholders and preferred stockholders since they will not be so much concerned by fluctuations in the price level. If the trend of the price level is downward, future computations of fair value would be lower and a reasonable rate of return would produce less revenue out of which to pay dividends and interest. This risk would be avoided under the prudent investment principle. But it is a serious question whether the prudent investment principle is not detrimental to the interests of common stockholders. There would in all probability be difficulty in attracting an amount of equity capital sufficient to provide the balanced capital structure hitherto considered desirable.

But perhaps a more fundamental objection which would affect the attractiveness of public utility securities to investors lies in the fact that since investors are limited to a stated return on their money invested, they must receive a highly unstable real income in terms of purchasing power. In these days of managed currency and economic planning, the purchasing power of money is subject to more violent fluctuations. Real income depends upon purchasing power and not money income. We gain little by stabilizing some money incomes and experiencing a larger shift in real incomes.

But there is still another important factor to consider in the interests of the rate payer. I think I am correct in esti-

mating that the great preponderance of prudent investment in utility property now used and useful was made in the era of high prices. A valuation taken on the basis of actual prudent investment cost would in this event show a larger total than a valuation either on the basis of present cost to reproduce the identical plant or present cost to reproduce the identical service. If my opinion is correct, it would seem to be just the wrong time to shift from the fair-value principle to the prudent investment principle, if one were to be governed by the selfish advantage of the consumer.

But to return for a moment to the investor, we note that there is a parellel in the movement of construction costs of utilities and the costs of living of security holders. The prudent investment principle will tend to stabilize money returns from year to year. The present "fair value" plan permits the earnings of utility companies to be adjusted to the rising construction costs. Rates may be higher when consumers' incomes are higher. Conversely when incomes are low, rates may be reduced. The existing plan seems to give greater real stability to investors and consumer. After all, we must agree that what present and prospective investors are interested in knowing is whether profits are being earned and whether the capital invested or to be invested will continue to go on earning profits and whether the rate of return is reasonable. As a matter of fact, the balance sheet of an enterprise is for this purpose almost of negligible significance. The balance sheet, moreover, omits one of the most important factors of earning power—namely, the skill and ability of the management.

We come then to this conclusion that a closer examination of the prudent investment principle discloses weaknesses which are not less than those of the fair value principle despite its more alluring appearance at first sight. We are forced to the conclusion that neither system is exclusively ideal if we are to treat equally investors and consumers, or classes of investors and classes of consumers. There is no evidence to warrant us in assuming that any more satisfactory results would flow from the adoption of the prudent investment principle, especially when the spirit of negotiation so widely prevails in relations between operating companies and commissions. Certainly, we should hesitate before abandoning a plan that we know something about and with which we have had experience. Probably the ideal situation always is to make wise concessions to any definitely practical situation.

In my opinion, no wiser decision in a matter involving economics was ever made at the time it was made than that of Smyth v. Ames. No legal principle more sound from a practical standpoint was ever established in a court of law. The Supreme Court wisely adopted a basis which does permit the recognition of all relevant factors in considering questions involving fair value and rates of return. And as experience has shown, it is a wise legal principle which provides that the base on which rates are to be determined is the value at the time of the inquiry of the property used and useful in the public service, such value not to be determined on an arbitrary formula, but a reasonable judgment based on adequate consideration of all evidence.

Of course, it must be granted that the process of determining fair value has been costly and time consuming in many instances, and the impatience with the delay and the criticism of the cost have been reflected in proposals looking toward some new alchemy or process by which these objections might be overcome. Cumbersome as the rule of the Court may appear to the layman or to the critics, the violent fluctuations both in price levels and in the value of the dollar have precluded the adoption of more simple processes if economic justice was to be done.

THE EDISON TOWER

MARKING the site of experimental laboratory at Menlo Park, N. J., where Thomas A. Edison's first practical lamp was produced and tested, and where he invented and designed a complete system for generating and distributing electric current, the Edison Tower will be dedicated on Feb. 11, 1938.

The Tower rises to a height of 131 ft. 4 in. above ground level. Atop a 117 ft. 8 in. concrete slab structure, in a steel frame is a 13 ft. 8 in. replica of an incandescent lamp, which, nightly, will shine over surrounding countryside. This large bulb is to be serviced by four 1000-watt, four 200-watt and four 100-watt electric bulbs. It is comprised of 153 pieces of amber tinted Pyrex glass 2 in. thick; weight exceeds 3 tons.

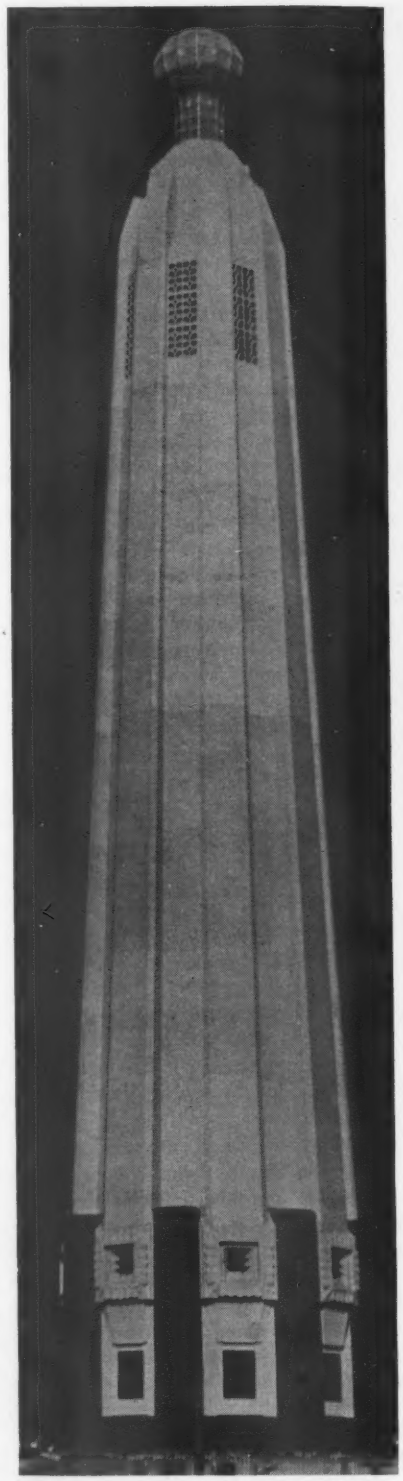
Commemorative also of the birthplace of the phonograph is a modern sound system installation. Through this equipment the first program will be rendered on the occasion of the dedication of the Tower.

The Edison Tower has been donated by William Slocum Barstow in behalf of Edison Pioneers to The Thomas Alva Edison Foundation.

Specifications of the Tower

Overall dimension	24′ at base
Height	131′—4″

Tower designed for pressure of wind velocity 120 M.P.H.
1200 Barrels of Edison Portland Cement.
50 Tons Reinforcing Steel.
Glass bulb contains 153 pieces amber tinted Pyrex glass, 2″ thick.



Bulb	13′—8″ High
	9′—2″, diameter at widest part
	5′ diameter neck

Illuminated by:
4—1000-Watt bulbs
4— 200-Watt bulbs
4— 100-Watt bulbs.
Bulb Weights over 3 tons.
Perpetual Light switched on October 21, 1929, by Thomas A. Edison from Dearborn, Michigan.
Perpetual Light unharmed by lightning which on August 12, 1937, destroyed temporary steel tower.

How A Medical Service Can Aid Industry

By Hart E. Fisher, M.D., F.A.C.S.
Chief Surgeon, Chicago Rapid Transit Company, Chicago, Ill.

LIVING, as we are today, in a so-called changed world where the things of yesteryear are considered obsolete and not befitting the times, it is essential that we give careful thought to all those things that pertain to employee relations. Especially is this true regarding a policy of employee health conservation in industry for those medical activities between the employer and employee.

In the past, industry was concerned for the greater part in the prevention of accident and taking care of those employees who were injured during and in the performance of their daily work. Those far seeing executives who built for the future were aware that they also had a direct interest in the physical well-being of their employee family and inaugurated preventive and remedial measures that, while not compulsory, gave aid and assistance in maintenance of men in the state of health that assured them of keeping their employees gainfully occupied for the greatest possible work longevity.

Value of Health Conservation Programs

The value of an employee health conservation program, through aiding industrial employees to keep themselves physically fit for the work they are to perform, cannot be shown in dollars and cents, but a successful plan in operation will show definitely favorable results within a short period of time, warranting a continuance and expansion of this form of employee relations. A healthy man is usually a safe man, an efficient producer, contented with his work and having a feeling of security for his later years, all making for better employer and employee relations.

The large industries are able to maintain medical departments, competently managed and equipped to give medical and surgical service to their employees but it has been often claimed that such services are not possible in the smaller company with fewer employees. This is an erroneous supposition usually defended on the theory that the cost would be prohibitive, and that therefore the small company in the small community could not support a medical policy of employee health conservation.

DR. FISHER

The solution of the problem lies in the joining of two or more of the small companies in a plan that will give such a service at a lower cost to the participating companies. Such a joint medical policy can be ably administered by local physicians and surgeons in the community and at a cost that will be mutually acceptable to all concerned. The community physicians would be eager to cooperate in the maintenance of men in industry if given the opportunity as decided benefits would also accrue to the physicians by such a contact.

Failures Due to Makeshift Plans

While it is true that some companies have inaugurated medical activities, other than the caring for those injured while on duty, and have later abandoned the work because of the attendant cost, investigation of some of these failures has revealed that the plan adopted was a makeshift, hastily put into operation without first studying the needs of the particular industry, and the initial outlay of money was of such proportions that the results obtained did not warrant such cash expenditures. It was also in some of these failures that an ulterior motive back of their medical policy spelled ruin at the very beginning of the plan.

Those employers who had the humanitarian viewpoint and the honest desire to materially aid their employees in keeping themselves physically fit did not venture a policy in haste, but studied all phases of their plan, taking one step at a time and when this reached successful fruition, they embarked upon the second step. This method does not require great initial expenditures of money and as the plan is expanded costly mistakes are avoided. Build slowly on a firm foundation, not in haste, if real success is to be obtained and employee confidence forthcoming.

The Attack on Occupational Diseases

Occupational disease in industry has aroused fears and doubts in our minds as did the workman's compensation laws when they were first enacted two decades ago. What industrialist, who has experienced the real benefits of the laws to both employee and employer, would care to go back to the old method of meeting the cost of employee injuries? Prevention of those disease conditions in industries subjected to them will in a like manner be beneficial to all con-

This is the second of a series of articles on Medical Service in Industry, prepared by the Subcommittee on Health, of the Accident Prevention Committee, E.E.I., composed of: Dr. Hart E. Fisher, Chicago; Dr. Noel G. Monroe, Boston; Dr. J. J. Wittmer, New York City; Professor Morris Viteles, Philadelphia and Wills Maclachlan, Toronto, Ont., Chairman.

These articles will appear monthly in the BULLETIN *and will present different phases of the types of assistance that can be given to industry by the Medical Profession. The Introductory article appeared last month.*

The Subcommittee will welcome comments and discussion of these articles. These comments should be addressed to the

SUBCOMMITTEE ON HEALTH
Edison Electric Institute
420 Lexington Ave., New York, N. Y.

cerned. Prevention of accidents in industry has reduced the frequency and severity rates materially where real safety work has been in force. With this reduction, we, likewise, have had reduction in accident costs. Detection of occupational disease cannot be done with any value unless we first, both the employer and employee, have knowledge of definite health hazards and the state of physical being of those working in the industry. Time and experience alone will determine what these hazards are and their effect upon those working in their environment.

How will this information be secured? The answer is through a policy of employee health conservation with competent pre-employment physical examination to ascertain the physical fitness of the man to safely perform his allotted work, the placement of the individual in work that he can safely and efficiently carry on, and thereafter periodical medical survey of the employee at regular stated intervals during his service with the industry for the detection of defects, both mental and physical, that might develop after entrance into the service.

Industry is not built on surmise, but on known facts. Thought governs the specifications of the machine as to its capacity and the careful consideration of the health specifications of the prospective employee should receive the same attention if the individual is to function with the greatest efficiency in safety to himself and those about him.

Superiority of Physically Fit Employees

Industry, years ago, was quick to sense, after costly accidents, the need for having within its organization some department which would be responsible for determining the physical fitness of employees. It was but natural that they should establish a medical department to conduct this class of specialized work. Placed in this department were medical men and women qualified to pass judgment on the physical condition of employee personnel and supervise all things pertaining to employee health. With the selection of the prospective employee, it was essential that expert advice and effort be expended over the working environment of the employees and assurance given that it will be a safe and healthful place in which to work.

Physically fit employees in healthful surroundings are paramount assets to safety and production. These are reflected in the superior quality and increased quantity of any given product. The reverse of such a policy is evidenced in a large labor turnover, high accident frequency, increased absenteeism from work on account of sickness and lessened production rate with an accompanying decline in product.

When Immediate Aid Is Needed

Employees, no matter how careful they are, sometimes have accidents which may result in injury or death with an economic loss, both to employer and employee. Many of these injuries, on account of their severity, must receive immediate attention if the patient is to live or his convalescence shortened. Here is the need of immediate accessible medical skill within the industry. Competent surgeons, skillful in the treatment of those injuries peculiar to the industry, available on short notice, assure the saving of life and the hastening of the patient's recovery. Frequent observation of like injuries arising out of the daily work in any industry, gives the industrial surgeons the opportunity of administering the treatment that experience shows the most efficient.

Many accidents occur in isolated localities where medical men cannot be obtained and if they are available a considerable amount of time must necessarily elapse before their arrival. This problem has to be met, as the injured employee should not be left to wait or be transported long distances to a medical authority. From this problem develops the need for instruction of first aid principles to the layman employee who could function until the medical man was available. It is the duty of the industrial medical officer to conduct this course in first aid to the injured within his industry. This, to our mind, is beautifully illustrated in the resuscitation from electric shock. None would deny the value of prompt and efficient first aid to the injured employee, after he has observed the many lives saved from the treatment of electric shock, not to speak of the many disabling injuries, if not death, from the reduction of wound infection, which previously received no consideration from the employee and was treated as trivial. First aid to the injured should be taught to the employee through a regular course of instruction, adequately supervised by medically trained officials whose duty would be to see that the training was kept within its limitations. This is the secret of a successful first aid policy.

The Problem of Absenteeism

A problem that gives grave concern to industrial executives is that of absenteeism from work on account of sickness. Hundreds of millions of dollars is the annual cost attributed to this problem. Absenteeism of a worker necessitates either temporary or permanent replacement by a substitute who may not be fully acquainted with the work he is to do. If he is acquainted with the work, he may be required to do two men's work, his own and the one he is substituting for. If he is not injured while carrying a double burden he may, on the other hand, through the ignorance of the position's hazard, be precipitated into a dangerous emergency. This absenteeism is expensive to industry and causes a decline in the otherwise orderly functioning of the plant.

The Medical Department has played an important role in the reduction of the rate of absenteeism to a more favorable point, partly by its ability to keep daily check on the illness of employees, through contact with the employee's private physician, and thereby see that the employee is returned to work at the earliest possible time in safety to his physical condition. To better serve the medical department in this reduction of illness, we have seen the advent of the visiting nurse into industry. Her duties are visitation of the sick employees to administer to their needs under the directions of their family physician, and if they have no medical advisor, secure the necessary medical aid either from a reputable doctor in the neighborhood or call on the medical department to send out one of its physicians.

Special Services to Lighten Medical Expenses

In order to make the burden of medical expense as light as possible to the employee, industry, through its medical departments, has provided special services, such as laboratory examinations of blood, urine, etc., x-ray pictures, surgical appliances, medical supplies, drugs and glasses furnished either at cost or gratis. This same courtesy of service is extended to the family of the employee when needed by their medical advisor. Cardiographic, metabolic tests, as well as physiotherapy treatments, are included in this laboratory service through industrial medical departments. There is eliminated the financial worry of laboratory examinations and the employee's physician is in a better position to receive money for services rendered, which usually is not the case when the patient's money has been used for special service.

Thus both good employee relations and good public relations have been served.

The average man will not seek medical advice unless he is actually suffering pain or has some unusual manifestation that arouses his fear. To prevent trivial symptoms from developing into more serious or incurable conditions, the medical department has within its scope a service of periodical medical examination for the detection of physical defects in the employee and the instituting of remedial measures that may prevent more serious complications. These examinations reveal those having physical defects which can be corrected to normal or where correction is not possible to make them safe in their daily activity and aid in the placement of work that they can perform safely and efficiently.

Value of Medical Surveys

These medical surveys have demonstrated that the defects found are correctible in the greater proportion of employees without change of occupation. Very few are of such a nature as to cause severance from the industry. Any means of conducting these examinations, other than through the medical department, are impossible. The medical department can follow up the employee defects found and see that remedial measures are carried out and that the individual with uncorrected defects is placed where he can function safely. Today, after all the propaganda by the medical profession pertaining to medical examinations, there is a wide diversity of opinion as to their real merit, what examination procedures are essential in a thorough survey, the real hazards attendant on the various physical defects and the comparative value of examinations made in industry over those made by the private physician.

These doubts are best dispelled by the experience of those industries that have made periodical medical surveys of their employees during the past two decades, through the medium of their medical departments. It is the sincere belief by those experienced in industrial medicine that periodical medical examinations, competently performed, done at regular intervals as warranted by the nature of the particular industry and conscientiously adhered to, can only be accomplished with any security by the medical men trained in industry as to its needs and hazards.

Those in industry have long been aware of the high cost of employee sickness and the financial burden and worries accruing thereby. The idea of lessening the burden was one of humanitarian motive that actuated the establishment in industry of a medical department. That the resultant work of these medical departments have met with success is attested by the friendly co-operation of the medical profession and without usurping the private physician's prerogatives.

Medical-Legal Aspects of Injuries

It is not altogether avoidable that employees and customers may receive injuries while on company property and it is essential that industry have within its ranks a medical authority who is able to advise on medical-legal phases of the individual case before the industrial commission or in a regular constituted trial court. Medical advice of an unbiased nature is necessary if an amicable settlement is to be made with the claimants. Only experience and contact with a large number of such cases can fit the medical officer for this important work. Hence the incorporation of this work in the medical policy. Here again the private physician is at a disadvantage as to his lack of knowledge pertaining to situations arising in industrial life nor would he in many cases be able to spare time away from his private practice.

Co-operation with Safety Department

Close co-operation between the safety and the medical departments have resulted in many life saving practices. The safety engineer in industry, in his efforts toward elimination of dangerous practices and in machinery safeguarding, has felt the need of a medical consultant in the constant stream of unusual conditions that present themselves for his solution. The surgeon who gives the initial service to an injured employee usually obtains a clear and concise description of just how the accident occurred and is of great value to the safety engineer in prevention of a recurrence.

The Doctor and the Purchasing Department

One would hardly suspect that there is real value in co-operation between the medical and purchasing departments in the conservation of employee health. There is a decided value when one considers the vast variety of oils, acids, paints, greases, etc., used in industry which may carry a hazard in their use. If the dangerous materials are not examined and protection thrown about the employee in their use, accidents and so-called industrial disease may arise. The medical department functions here, in that it is called upon to examine and pass judgment upon the ingredients, approving those that are harmless and eliminating those that carry a hazard in their use. Further protection is provided the worker in leads, paints and zinc by periodical monthly examinations, in order to detect poisoning from their use. Certification is given to the state and federal health authorities each month as to the presence or absence of industrial poisoning from their use. This certification of the absence of industrial hazards could not be accomplished except through the industrial medical department personnel. The detection of disease in food handlers is likewise only possible by a medical department personnel who is on the job continuously.

The problem of securing specialists service, consultant counsel and hospitalization of employees is an ever increasing work, carrying with it many difficulties that only the medical department in industry could handle with any degree of success.

Formulating a Medical Policy

Those important features that enter into the successful operation of a medical department in its services of employee health conservation and which are seldom stressed, but which determine success or failure, are briefly outlined here for consideration. Study the requirements of your industry, then compile an outline of a medical policy, giving particular attention to those things which appear to be the most important to you and give them your immediate attention. If it be plant sanitation, make that the starting point. If it is absenteeism from work on account of sickness, begin your efforts there. If it is the need of an employee physical audit, make this your initial effort. Take your employees into your confidence, make them acquainted with your plans and what your intentions are toward employee health conservation. Avoid secret, mysterious plans, avoid anything with an ulterior motive back of your policy, as this spells failure.

Avoid These Things

Patronage, favoritism and pull have no place in a well organized medical department where it concerns the safe and efficient operation of the industry. Political influence should not be tolerated in the placement of persons in the medical department. Avoid those factors that have a tendency toward deterring us from what our conscience dictates. The medical personnel should seek the advice and co-operation of brother officials and department heads. Listen to their wisdom and practical experience and avoid

humilating mistakes. They know how their property is conducted so be their medical advisors and avoid any attempt at dictation of policy. The medical department personnel must sell themselves and their medical product to the industrial officials and they will in turn receive co-operation in selling and carrying the medical policy to the employees.

Solve First Problems First

Begin in a small way and accomplish your first problem before attacking the next. Prove its value in industry. It is far better to do one thing well than many things in an incomplete manner. Those in industry are quick to sense the value of their medical advisors. Remember, that what is good practice for the president, is good enough for the rank and file in industry. Avoid distinction in medical service. There can be no two grades of medical service. Service for our employees should be on par with that to paying patients. In the making of decisions affecting employees, the medical personnel should be certain that they are right so far as it is possible to be, as retraction and changing of decisions make for loss of respect and confidence by the employee.

When criticism of medical department work or personnel is made, be quick to run the criticism to earth. If justified, acknowledge it and rectify the conditions so that repetition is not possible. If unjustified, see that proper steps are taken to stop such criticism. Unquestioned gossip soon assumes the dignity of truth if ignored. Be calm in action, have poise—that will instill peace on the troubled waters. Avoidance of anger either to medical personnel or employees shows the real character of your medical official.

Relations Between Doctor and Employee

Your medical advisor should be the court of last resort in medical matters, his decision final, if not dictatorial. His value is in his being able to make recommendations for the mutual benefit of employer and employee in the conservation of health. He should avoid going on record through the medium of letters relative to employee sickness, as this is an open source of gossip by other employees who may chance to see the letter on some official's desk. He should censor drastically any criticism of other doctors before employees, as this will act as a boomerang and be returned to his embarrassment in full force many times.

Treatment and examination of employees in the department must be of a high degree and in strict privacy, avoiding the dispensary atmosphere. Examination findings should be kept in strict confidence. When the employee seeks advice, his complaint may seem trivial, but it is important to him. He expects advice and treatment if warranted. He merits attention the same as if a handsome fee were in the offing. He is quick to sense slackness and convey his impressions to his brother employees.

The fact that the company provides the money for the operation of the medical department does not call for waste and extravagance. This has caused the failure of many departments otherwise competent and of value in health work. Conserve the company's finance, as the medical officer's business ability is judged by his expenditures and the value accruing from same.

Benefits to Employer

"How a Medical Department Service Can Aid Industry" is best illustrated by showing the benefits that accrue to employee, employer and customers of the industry concerned. What does the employer in industry receive for his efforts and money expended in this work of maintenance of men? He has the assurance of a mentally and physically fit employee at the time he enters his employ. He knows that this healthy man or woman will be less liable to injury. If injured, he is not so apt to have his injuries complicated by the presence of some defect not known before the accident. Absenteeism from work due to sickness will be reduced within reasonable limits as a result of the detection of defects made possible by the periodical medical survey of employees. The knowledge that his employees are at work in healthful surroundings which are conducive to good health and work will be a mental pleasure for him. When an employee is injured he knows that the best of service, medical and surgical, is at hand and that everything will be done to return the employee to his work and family in as short a time as possible.

From a medical standpoint the sick and accident benefit will be administered with justice to employer and employee, thereby reducing the cost of operation of this phase of employee relations. All necessary health reports will be sent to the necessary federal and state authorities on time and in such shape that censure will not be forthcoming, also liability of fines for failing to comply with legal statutes will be avoided. When an employee is ill at home he knows that he will not be neglected and that the company, through its medical department, will keep in contact with him. When an employee is sick is the time he needs closer contact with his employer than ever before, if good employee relations are to be a success. The labor turnover will be reduced to a minimum. The pension lists will not be overcrowded with sick and infirm employees prematurely. The accident frequency and severity rate and man hours lost on account of injury will be diminished. The production rate will be hastened and the finished product will be of a higher grade. A healthy employee is a many times safer employee as well as a better craftsman. An efficient, healthy employee is an asset to the organization. The sick man is prone to accident possibilities on account of the physical handicap and the quality of his work is of a lower grade than that of his more fortunate brother, who has guarded his health. The sick man is a direct liability to the organization in proportion to the severity of his defects. The foregoing facts seem sufficient to prove the contention that the employer receives full value for the money invested in the medical department in employee health conservation.

Benefits to the Employee

What about the results to the employee? The employee knows the status of his health when he is employed. He receives a health audit at sufficient intervals to detect any ailments arising after entrance into service. He is encouraged to have his defects corrected, thereby avoiding more serious complications with loss of wages while sick. He knows that by being healthy he is less liable to be injured in accident as his mind is not distracted from his work on account of illness. If he does become ill or injured, he rests in the security that competent medical and hospital service will be his. He is assisted financially through the benefit and insurance features medically administered through detection of fraudulent claims and the reduction of unreasonable length of convalescence. The employee knows that he works in a healthful environment and if he becomes physically disabled he will be placed in work where his defects will not be a handicap. He knows also that he will not be thrown on the "scrap heap." The employee will know that he will be aided medically in maintaining a good physical condition and the cost of his being sick will be reduced; that he will receive specialist and hospital care within his means. He knows that those working with him are as healthy as himself. He sees a more

happy feeling existing where men are healthy. His length of service in the company is lengthened through medical supervision. He is quick to understand such a medical policy without any ulterior motive will render the best medical service possible and he will co-operate toward its continued success. The old cry "give us the money and we will take care of our own health" is heard less and less as these men come to realize the value of medical supervision without the sting of compulsion. If left to our own initiative, even though we have money, we are likely to postpone seeking medical aid until actual pain causes us to stop work. Then it may be too late.

The Public Benefits Also

What benefits accrue to the public, our customers, from a medical policy of employee health conservation? The public shares these benefits through the knowledge that the employee is in good physical condition and assures them freedom from the transmission of contagious or infectious disease. Courtesy also goes hand in hand with good health. Many a sharp answer from a sick or ailing employee has invoked criticism. The customer is assured that, if injured on the company property, competent surgical and hospital aid will be his without delay and when recovered he will receive compensation for resulting disablement on an amicable basis after an honest medical examination in the medical department. This makes for good public relations and if the public is not aware of what the medical department does for their safety, let them know about it through scientific public exhibits of the activities of your policy of health conservation.

The community physician who lives in the same community with an industry that has a well developed medical department comes in for a large share of benefits in proportion to which he is willing to co-operate and serve without suspecting that someone is endeavoring to usurp his prerogatives. He will receive work that he ordinarily would not receive if it were left to his own initiative. Those employees having defects are referred to him for remedial measures.

Standards of Service

In the future there will be a greater increase in industrial medical departments and to be assured that they will be confined as to service, within reason and not enter into competition with private medicine, such bodies as the American College of Surgeons and The American Medical Association will plan standardization of a minimum nature that will govern the character and requirements of such an industrial service. Such certification by one or the other of these medical bodies will be a source of great pride to those medical departments already doing fine work. Those departments doing inferior work will be obliged to improve their service to industrial employees or hear from their employers in no uncertain terms.

Industry should realize that it has in each of its employees an investment of capital through training the man for the work he is to do, education in working safely, amenable to shop procedures and routines, inculcating a sense of discipline in his work and by maintaining this employee in a healthful state, both in mind and body, it will be possible to keep him as an economic factor within the employee family for the greatest length of time possible.

Electric Water Systems—Plans for 1938

THE Electric Water Systems Council was organized in 1933 to promote the use of running water in rural homes.

A nation-wide sales drive was planned with social and economic objectives. A home with running water is a better home in which to live, and the adopted slogan of the Council is expressive RUNNING WATER — YOUR FAMILY DESERVES IT. The economic objective was the building of closer cooperation between utility and local pump dealer to bring about greater sales.

Let's look at the record. In 1933, the year the Council was formed, sales had been 57,000 units. In 1934, 77,000 units were sold; in 1935, 108,000, and in 1936 the total amounted to 154,000. "Our work is not half done," said both manufacturer and utility men on the Council. "Let the good work go on" and 1937 rang the bell with approximately 190,000 units.

The Council has been led by P. H. Powers of West Penn Power Company, Pittsburgh, until this year when Harris E. Dexter of Central Hudson Gas & Electric Corporation, Poughkeepsie, succeeded to the Chairmanship. Mr. Powers remains a member of the Executive Committee together with C. H. Leatham of Monongahela West Penn Public Service Company, Fairmont, and C. E. Greenwood, Edison Electric Institute.

Representing the pump manufacturers are C. W. Coapman, Delco Appliance Corporation, Rochester, N. Y.; G. R. Deming, Deming Company, Salem, Ohio; N. G. Gould, Goulds Pumps, Inc., Seneca Falls, N. Y.; J. C. Myers, F. E. Myers & Brother Company, Ashland, Ohio; W. T. Hatmaker, Duro Company, Dayton, Ohio; and H. C. Angster, Secretary.

Sales plans for 1938 will shortly be announced. A Plan Committee under H. F. Miller of Goulds Pumps, Chairman, together with C. D. Leiter of F. E. Myers & Brother Company; L. H. Taylor of Deming Company; R. J. Webb, Philadelphia Electric Company; D. W. Rice, West Penn Power Company, and C. G. Glueck, Ebasco Services, Inc., are responsible for production of promotional material.

The 1938 Plan Book carrying full details will be distributed on or about February 1. A Plan Book for dealers and interesting mailing pieces for consumers are features. In addition, the sound slide film, Life In The Country, will be given wider distribution.

Electric light and running water are the first considerations of the rural dweller when connected to the high lines. We may expect the water system will be given a prominent place in the load building efforts of the utility.

—C. E. G.

Coordination of Power and Telephone Circuits

DURING the past ten years a large number of reports have been issued presenting the results of studies of the inductive and structural coordination of power and communication circuits conducted jointly by the Edison Electric Institute and the Bell Telephone System.

As an aid in the use of this material there has been prepared a classified index covering reports of the Joint Committee on Plant Coordination, Engineering and Provisional Reports of the Joint Subcommittee on Development and Research, and jointly prepared papers presented before the American Institute of Electrical Engineers. Copies of this "Classified Index of Technical Information on Inductive and Structural Coordination" may be obtained without charge from the Edison Electric Institute.

PRIZES

to be administered by the

EDISON ELECTRIC INSTITUTE

AND AWARDED IN 1938

PRIZES TO INDIVIDUALS

For Papers on Subjects Relating to the Electric Light and Power Industry

BYLLESBY PRIZE . . . . . *Accounting*

Cash prizes of $100, $50 and $25 donated by Public Utility Engineering and Service Corporation, in memory of Colonel H. M. Byllesby, for the three most meritorious papers on any Accounting subject relating to the Electric Light and Power Industry.

FORBES PRIZE . . . . . *Public Relations*

A cash award of $250 donated by Mr. B. C. Forbes, Editor, Forbes Magazine, for the most meritorious paper dealing with the subject of Public Relations in the Electric Light and Power Industry.

LINDEMANN PRIZE . . . *Electric Cookery*

Cash prizes of $150, $100 and $50 donated by Mr. A. L. Lindemann, President, A. J. Lindemann and Hoverson Company, for the three most meritorious papers dealing with the Advantages of Electric Cookery for Domestic Purposes.

McGRAW PRIZE . . . . . *Engineering*

Cash prizes of $250, $150 and $100 donated by Mr. James H. McGraw, Honorary Chairman, McGraw-Hill Publishing Company, for the three most meritorious papers on any Engineering or Technical subject relating to the Electric Light and Power Industry.

RULES AND CONDITIONS OF CONTESTS FOR PRIZES TO INDIVIDUALS

Any person employed by an electric light and power company is eligible to enter the competition. No person is eligible to win two years in succession the identical prize or lower prize of the same award, but is eligible for a higher prize of that award. Papers must be the original work of the author or authors, prepared exclusively for this competition. Papers may be of any length, and pen-and-ink drawings or photographs suitable for reproduction may be included. Papers should be typewritten on one side only.

The first page of the manuscript must give the following information: the name of the prize for which the paper is submitted, title of paper, name of author, name and address of employing company, title or character of position and home address. One paper may not be submitted for more than one prize.

Papers not receiving awards will, upon request, be returned to contestants after the awards have been announced at the 1938 Convention of the Institute. Prize winning papers will be available for inspection at the general offices of the Institute.

PAPERS FOR ABOVE PRIZES MUST BE FORWARDED, IN DUPLICATE, BY MARCH 1, 1938

PRIZES TO COMPANIES AND INDIVIDUALS

For Accomplishments in Specified Activities

CHARLES A. COFFIN AWARD

Sponsored by the General Electric Company

A Gold Medal, known as the Charles A. Coffin Medal, will be awarded to the public utility operating company within the United States which, during the year 1937, has made a distinguished contribution to the development of electric light and power for the convenience and well being of the public and the benefit of the industry. The company awarded the medal will also receive $1,000 for its employes' benefit or similar fund.

AUGUSTUS D. CURTIS AWARD

Lighting of Buildings

A certificate donated by Messrs. Darwin Curtis and Kenneth Curtis, of Curtis Lighting, Incorporated, in memory of Augustus D. Curtis, to the public utility operating company within the United States which, during the twelve month period ending March 1, 1938, has shown the greatest contribution to the advancement of Artificial Illumination of interiors or exteriors of Commercial and Public Buildings, and a cash prize of $300 to the individual or individuals in that company responsible for the achievement. A second prize of $200 and a third prize of $100 to the individual or individuals responsible for the achievement of the companies adjudged second and third in the contest.

GEORGE A. HUGHES AWARD

Domestic Electric Cookery Load

A trophy donated by Mr. George A. Hughes, President, Edison General Electric Appliance Company, Inc., to the public utility operating company within the United States which, during the year 1937, has shown the greatest contribution to the development of the Domestic Electric Cookery Load through promotion, or selling, or both, and cash prizes totaling $1,000 to the individuals responsible for the achievement.

THOMAS W. MARTIN AWARD

Rural Electrification

A bronze plaque donated by Mr. Thomas W. Martin, President, Alabama Power Company, to the public utility operating company within the United States which, during the year 1937, has shown the greatest contribution to the advancement of Rural Electrification-Agricultural advancement within the company's territory due to uses of electricity, development of rural load, cooperation with other agencies, extension of rural lines, organization and plan for conducting rural electric development.

IMPORTANT—Complete details for the Charles A. Coffin Award, the Augustus D. Curtis Award, the George A. Hughes Award, and the Thomas W. Martin Award should be secured from the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y.

Elaborate and costly exhibits are unnecessary. The merit of the enterprise presented in papers or exhibits will be the prime factor in determining awards, without regard to the size of competing companies.

PRESENTATIONS OF ACCOMPLISHMENTS MUST BE FORWARDED BY APRIL 1, 1938

Papers and exhibits for 1938 prizes should be addressed to the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y. Winners will be announced and prizes awarded at the 1938 Convention of the Edison Electric Institute

PRIZE AWARDS COMMITTEE: Charles W. Kellogg, James E. Davidson, H. P. Liversidge, Chairman, Lewis B. Beatty, Secretary

Forget The Hole—Let's Tackle The Rim

By C. E. Greenwood
Commercial Director, Edison Electric Institute

AMONG the influencing factors in bringing about our present dilemma in marketing is Fear. Of course there are other reasons—high prices, economic stress, unsatisfactory trade relations and such obstacles, but the fear psychology tops them all for retarding sales.

Tom Jones comes home out of a job and Mrs. Tom issues drastic orders to "save" everywhere. And then Bill Brown's wife, a neighbor, hears the bad news. Bill's chances of staying on his job are fairly bright. He is in another line of business, but Mrs. Bill decides the order for saving in that family too should be promulgated because worse conditions may be just around the corner.

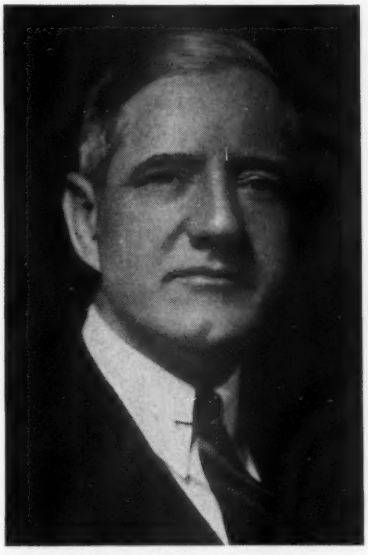
"There it is emblazoned in the headlines of the newspaper. Read it for yourself," says Bill's wife—"The Government is feeding millions. You cannot be one of the eight million or more unemployed even if the story does say that 25 per cent of them are out of work because of sickness or change of job, and even if 1,700,000 more are on relief work.

"And that is not all," continues Bill's wife. "The President warns the Economic Royalists (and that big guy you work for is one of them) that if the Government does not step in and slap the big stick on business that business is going to ruin so you will be out of a job anyway.

"And see here—Congressman Bouchwaw says Amen to the President's admonition, but tells us that all of the people here will be fed."

How can Bill be reassured under the circumstances? In fact it is not difficult to work him up into a lather of fear with this picture of dire want hovering over the household. Granting that Bill's exchequer has not been crimped, he is still moved to put a steel band around the old wallet. The "rainy days" that Bill anticipated are pouring in on him and he needs all the money he has saved for food and clothes and will not think of buying that electric range, or water heater or washing machine or what-not that the salesman was to close with him —not NOW.

So the inevitable happens. Sales of



MR. GREENWOOD

equipment drop with a thud, and at the same time the utility transformer loadings register the results of dead equipment in factory and store. These are the barometer also of thrift in use of electricity in the household which subsequently follows.

Does the chain of events stop there? Oh no! The contagion of "fear" may spread to the utility executive. "This is a tough situation," says he as he forges another link in the chain of curtailment. It is natural for him to query—"Why advertise when people have no money to buy?" The writer had the temerity to answer that question in the columns of the BULLETIN, issue of October, 1937. It is of interest to note that the President of one of the leading industrial companies, manufacturer of scores of diversified products, testifying at the Senate Unemployment Hearing this very month, forecast a 23 per cent drop in the business of his company in the next six months. But, said Mr. Lammot du Pont, the corporation is doing everything "compatible with sound business practice to maintain employment and sales at highest possible levels." His company had not curtailed advertising, sales promotion and research expense, which Mr. du Pont referred to as "a form of insurance on the future."

There is no group of business leaders that has taken it on the chin during the past two years—and standing up—more than the utility executives. They are not "afraid" but rightfully cautious and in too many instances, they are victims of circumstances beyond their control. The impact is felt by the responsible commercial chief. He can see that hole in the marketing doughnut. In fact he could lose his head in it. But what about the rim? Therein still lies a marketing area.

Let us pause to ask what people have not enough money to buy necessary electrical equipment and services? Not those with salaries published in the news columns, and thousands of others of the unheralded middle class; not the thousands of white-collar men still employed and using electric service; not hundreds of thousands of laborers that are still gainfully employed in spite of rampant Unemployment; not the Government, State, and Municipal employees including the school teachers; not the doctors and lawyers, the bankers and brokers and their employees and innumerable others who "could buy" if they were not afraid of that "rainy day" that they had saved for being upon us.

In his recent message to Congress, the President brought out that the income of the nation had been raised from 38 billion in 1932 to 68 billion in 1937. Surely millions of people shared in the business represented. Conditions point to a continuation of Government spending in both rural and urban fields. I add rural notwithstanding the prediction of the Agricultural Department at Washington that the economic improvements that the farmer has enjoyed for the five past years have little opportunity to continue in 1938; which would indicate the farmer would tighten up on his purchases also. Not long since my interested attention was drawn to the statement by a man close to the local situation, that power lines built with Government loans were about ready to serve a Cooperative group many of whose members were being visited periodically by the Relief trucks. It appears that not all those in adverse circumstances are afraid to buy what is needed and what is helpful if properly induced. There are numerous items of electrical equip-

ment that have an important place in this class.

There are other indications of potential buyers.

Word comes from the Rocky Mountain region that the sales forces of utilities and dealers united their efforts for intensive selling when the sales slump came along, and through the agency of novelty and dramatics were able to induce productive results with their slogan "Give Something Electrical for Christmas." As the news report expressed it, "Thousands of recession-shy dollars, destined for other purposes were diverted into electrical gift channels." Industry action seldom fails to work.

We find the General Federation of Women's Clubs going to the President of the nation with a simple plan to ask each family to "spend a little more" rather than to follow the usual tendency to hoard. Quite an unusual program to meet an unusual situation.

Looks like the selling of 1938 *could* produce totals of 1937—at least—but only with WORK and SELLING TECHNIQUE to overcome that deferred action complex on a still large buying public.

Now a few suggestions for maintaining that small share of the elusive consumer's dollar that the utility industry has been able to obtain. I recently saw a full page advertisement of a leading store in a New York evening paper. No mistake about it, it read—25 and 50 per cent off and even more on a long list of items. The opening hours brought hundreds of shoppers. *Unemployment* or *employment* they lined some counters two and three rows deep. No—these people did not come from just around the corner. It is a safe bet that many were commuters and paid the railroads to reach that and other stores that had BARGAINS. Perhaps this is the time for manufacturers to move some discontinued lines and over-stocks through utilities and dealers. The pleasure of getting a *bargain* will help smother the fear complex. So many utilities offer their kilowatt hours on the bargain counter today that the householder has a further incentive to purchase equipment.

Now it might be reiterated here that the "blood-stream" of the power company is energy output. The company depends upon this "blood-stream" for its economic health, and the nearer to maximum this output circulates into every business artery that will produce net revenue, the better that economic health. Like the human body, when the "circulation" clogs at any point there is an ailment that needs attention. When a section of the automobile factory closes down and men and machines are idle, the utility must wait for a cure for that stoppage of energy flow outside of its own organization. In the interim the marketing "doctor" looks about for other channels for this energy flow in commerce, in mercantile establishments and in the home. In other words he supplies Selective Selling, a practice which some companies are now finding effective. Happily the utility sells the same kind of kilowatt hours for an incandescent lamp or a motor or a furnace. If the idle factory cannot use the customary supply, the utility can sell its product in new fields where the arteries of business are alive and electricity can flow.

One of these live arteries is the home. Previous depressions have taught that there is a back-to-the-home movement at such periods. People become better acquainted with their own firesides. The laundry is done at home but with an electric washer and ironer or iron, but perhaps from the savings from using home labor over sending the washing out. If the maid has considered using a broom, surely the housewife will not when the maid has to go. A vacuum cleaner must be bought now. Dinner parties cost less when they are buffet style with electrical appliances. The radio runs longer hours to cheer both the employed and unemployed members of the household. The more prosperous of housewives are willing to give up the maid and put the savings into an automatic electric range. The thrifty wife without an electric refrigerator will accept the savings of quantity buying and food protection that only the use of electric refrigeration can give. And so it goes.

These people will continue to shop; the restaurants will serve their meals in air conditioned quarters; the office buildings will be humming; schools will be open to the full quota of pupils; hospitals will take care of the sick and night clubs and theatres will be taking care of those insisting upon excitement. One hundred thirty million people will be LIVING. *Let us bear in mind that one person in ten is unemployed. That is the hole in the doughnut. This means that nine out of ten are employed, which is the rim of the doughnut.*

Very soon a National Housing Act is going to be enacted into law. At the time of this writing certain details are not known. The chances for a modified Title I for building improvements are possible. FHA insured 500 million dollars in Modernization Contracts under Title I before it was stricken from the revised Bill and losses have been less than 2%. These can and will be cut down with more cautious rulings. Lighting, wiring and water systems may be favorably considered.

There will be provision in Title II which will stimulate the construction of small homes, particularly those costing $5,000 or less. It is expected that thousands of this type will be built and every one should be a customer for the electric utility. It is anticipated that a coordinated kitchen, with built-in electrical equipment, will be eligible for appraisal in the mortgage to be insured by FHA. At least this would be the only *fair* disposition.

These brief notes of optimism may point out reasons for keen, diligent selling now. Who will not agree that the rim of the doughnut offers profitable opportunities. Recessions call out the best salesmen. They demand mobilization of the real workers among them. Such times mean that every salesman must use technique par excellence, particularly judgment in choosing prospects. It means each one must work twice as hard to sell the same volume of business that he closes in normal periods. It means that holding the same sales record of last year in 1938 merits a medal just as much as scoring sharp gains would in good times.

David Lawrence, whose economic philosophy is read by multitudes in the newspaper columns of the nation, stated only recently that "The real political problem of the hour is to take care of a productive capacity unparalleled in the world." The utility does not have a productive capacity at present to take care of the possible energy output if all persons could express their electrical desires in sales. We of the utility industry must hold our ground as well as forge ahead to new levels of achievement.

Energy output established a record in 1937. It is irritating to commercial men to be held back, chafing at the bit, when another lap in the race for a greater goal is starting. But with the combination of

H elp from the Boss
O rganization
P erseverance
E nergetic Salesmanship

the commercial forces of the industry should hang up a satisfactory record of achievement in 1938.

Purchased Electric Power for Oil Refining

By K. K. Kreamer

Houston Lighting & Power Company

A paper presented at 9th annual meeting of Petroleum Electric Power Club, Shreveport, La., Dec. 9 and 10, 1937.

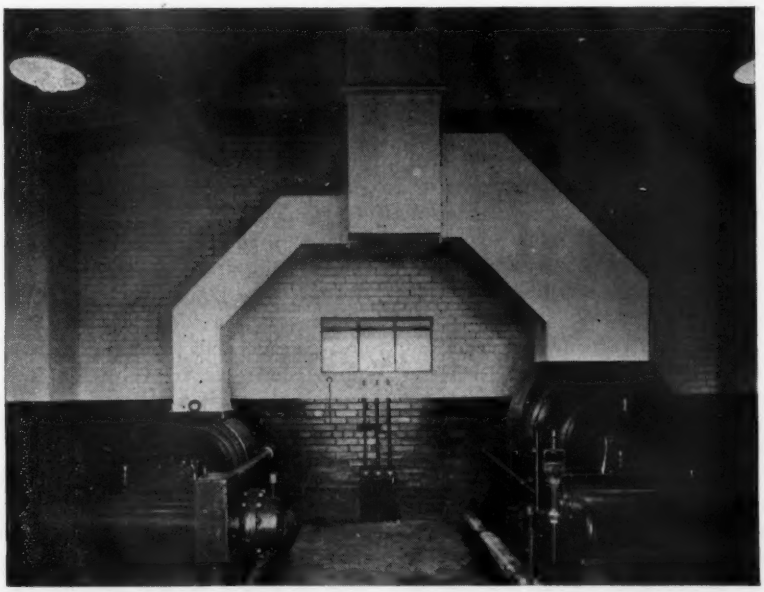
DURING the past conferences of the Petroleum Electric Power Club papers have been presented which traced the rapid advances made in the development of electrical apparatus designed particularly for the petroleum refining industry. It was pointed out that important factors in the widespread application of electric power in the refineries have been the development of the explosion proof motor, and improvements in pumping equipment. Data were given to show the many uses of electric drive and the potential loads which could well be carried by electric power. It is the purpose here to look into the application or use of purchased electric power, and to outline the advantages of such a practice and to develop the relation of purchased power to the business of operating a refining plant.

Let us review briefly the uses of electric power and their importance in the refinery operations. These uses may be divided into two principal classes; first, for the operation of auxiliaries which would include machine shops, conveying equipment and lighting; and, second, the use of electric power for the operation of equipment directly included in the refining processes such as pumping and compressing. Without doubt, the most important and certainly the largest power consuming application of electric power in petroleum refining is in pumping. From the time the crude leaves the storage tanks on its way to the distillation unit, it and its derivatives are kept in almost constant motion through the various processing states, and the propelling force necessary to carry the oils through these states must come largely from power consuming pumps. Another application of electric power which is of great importance in refining operation, and which exceeds the usage for oil pumping, is for pumping water for condensing and cooling purposes. Even in relatively small plants large volumes of water must be pumped. In many plants the use of electric power for compressor drives is next in importance to that of pumping. Numerous other applications and special uses could be cited which would show the important part taken by electric power in the refining industry.

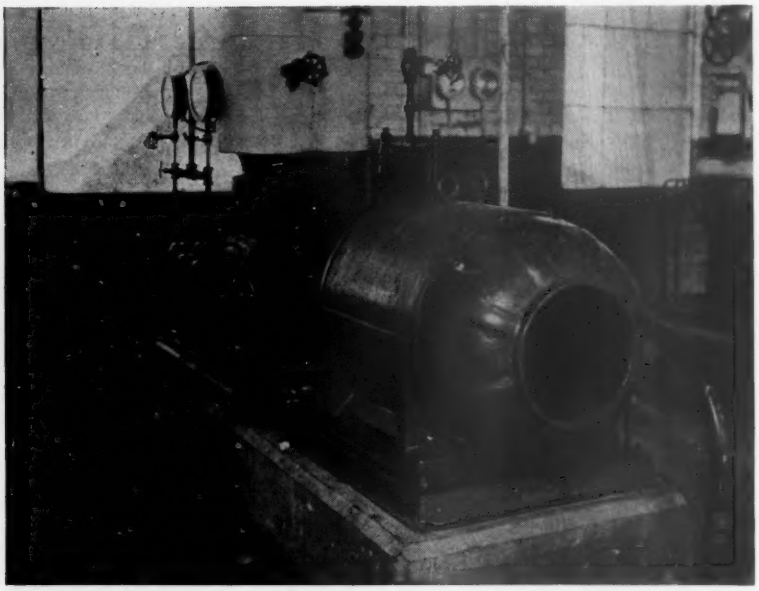
Having seen the adaptability of electric power as a prime mover, we turn now to a consideration of the sources of power for the operation of the electrical equipment and the factors having a bearing or influence on the selection of purchased power or private plant operation. However, it has been found that there are generally such differences, both from the economic and the operating standpoint, between a small capacity refinery engaged in, relatively, few processes and a large plant engaged in all or nearly all of the phases of petroleum refining that the economics of electric power supply must be considered according to the size and type of the plant or refinery. Although there is not necessarily a fixed relation between crude through-put and power requirements, we shall in this discussion consider a small refinery as one having an electric load of less than 500 horsepower.

The question might be asked, why is a plant a small plant or why was it not built larger? There are several possible answers to this question; first, the lack of capital; or second, in case adequate capital is available, then a reluctance on the part of the owners to invest a greater sum of money in the project; third, a limited or uncertain supply of crude; and fourth, a limited outlet or market for the gasoline or other products of the plant. The last three of these reasons certainly imply the presence of doubt or possible uncertainty as to the ultimate success or long life of the venture. Now let us see what relation exists between building a power plant or purchasing power for the operation of a small refinery.

In the first case, that of lack of capital, if a larger plant would be built if the funds were available, then that part of the total investment as represented by the power plant would likely yield a



500 hp and 700 hp, 3600 rpm motors, pipe ventilated, driving hot oil charging pumps in a large refinery



75 hp, 3600 rpm, 3 phase, 60 cycle, 2300 volts, type CS motor, dual ventilated, explosion proof, driving centrifugal pump in a refinery

greater return if invested in refining equipment rather than for providing a service which could be obtained elsewhere at far less investment cost. Furthermore, if a plant owner must borrow money and if loans are obtained to purchase power plant equipment, and even though these particular loans bear a relatively low rate of interest, the total borrowing power is diminished and further loans for refining equipment may possibly be obtained only at higher rates of interest, if at all. Hence, it is seen that through the use of purchased power more capital is available for process or refining equipment. In this connection, if money invested in refining equipment will not earn a greater return than could be secured from investment in a power plant, then it appears that the business in general is none too stable; and that brings us to the second basis of consideration—the economic life of the project.

Many small refineries are built near a source of crude or to take the crude output of a certain lease or field, and there are a number of factors affecting the economic life of the plant which are entirely beyond the control of the refinery owners. For example, the crude supply may decline or the cost of production become relatively high; conditions in the gasoline market may develop that the output of the plant cannot profitably be disposed of; or obsolescence due to improvements in refining equipment may prove to be a handicap in a very competitive field. All these things point to the desirability of low fixed costs which in turn mean fewer frozen assets in case of liquidation. A reduction of investment costs and risks may be effected by purchasing power requirements.

The ability of purchased electric power economically to meet drastic changes in operating conditions is of great value to the small refiner. At the outset, when the plant is growing, if the load increases, the utility provides the capacity without the customer being confronted with the problem of providing an unknown and indeterminate peak capacity. Later, if the load decreases, the customer is not burdened with fixed charges on an excessively large and consequently inefficient plant.

In a large refinery embracing many coordinated activities the requirements are immense and consequently an adequate power plant involves an investment in the million dollar class. Availability of capital is not generally the problem but rather the advisability of such an expenditure when purchased power can be obtained. In the past some of the large refiners installed steam driven generating equipment since large quantities of low pressure steam were required for various processes and the electric power was made as a by-product. A later development has been the use of back pressure turbines. Steam is generated at relatively high pressures, passed through the turbine for power generation, and exhausted at a pressure of about 150 pounds into the process steam lines. The success of such an installation is dependent principally upon the ability to balance the steam and electric loads. Such a procedure is not always a simple matter.

It has been claimed that a large refinery must generate the power needed in order to provide an outlet or use for a large amount of low grade or unsalable fuels. This may have been the rule years ago but is not necessarily true today because advances in refining processes have resulted in a great reduction of waste-product or residue fuels and with further improvements it is possible that these products will be reduced to minor importance. It has also been said that a refinery is by nature a large user of steam and that the back pressure turbine is the solution to fuel economy. This does not appear to be necessarily true but is a remedy for an old refinery which includes much old and inefficient steam driven machinery. Some of the latest refinery installations of modern and efficient design provide for the bulk of the plant load to be electrically driven by purchased electric power and only a relatively small amount of process steam generated.

We have seen some of the capital advantages of purchased electric power, consider now some of the operating advantages a refinery may secure through the service of a well organized and well equipped power company. Inasmuch as the operation of a refinery is virtually a continuous process, continuity of service is of vital importance. In this respect utility service is unequalled by any other form of power. The refiner can be assured that charging pumps and circulating water pumps will operate with maximum dependability. In some cases utilities have provided multiple circuits with automatic switching equipment so that service to the refinery will not be interrupted by interference on any one feeder. Another feature is constant full voltage supply and accurate frequency control. This means to the operator that motors will develop full rating without overheating and run at their rated speeds. Again we find the flexibility of purchased power, this time an operating advantage in the form of

unlimited capacity. Large motors or loads may be thrown on the line at will without the danger of dropping other loads due to voltage dips, and furthermore, only the exact amount of power required for a particular job is used and is paid for. This means higher efficiency and greater economy.

Operating costs, as regards power requirements, are definitely predictable with purchased power and are not subject to fluctuating prices for labor and materials or variable maintenance costs due to unanticipated breakdowns. A report made by the American Society of Mechanical Engineers shows a variation of 39 to 1 in the operating costs of 400 engine plants. Labor costs and problems are a minimum in a refinery using purchased power, and we have witnessed quite recently some examples of the advantages of such a condition.

Let us consider now the magnitude of the refining industry and see what usage of electric power is being made and what the possibilities are for an increased application of purchased electric power. As of Jan. 1, 1936, there were located within the United States 647 refineries of all classes having a daily through-put capacity of more than four millions of barrels. Of this total number only 422 were in operation and actually handled nearly one billion barrels of oil and consumed in excess of a billion kwhr of purchased power. It would be practically impossible to obtain the full operating records of all these plants; however, the records of 44 representative refineries have been secured and show some very interesting figures. Of the 44 plants, 17 were skimming plants, 17 cracking plants, and 10 complete refining units. The skimming plants handled 13 per cent of the total oil refined, the cracking units 53 per cent and the complete plants 34 per cent.

An analysis of total amounts of power used including purchased power, generated power, and equivalent mechanical power shows the following:

Skimming plants—
- 19% Purchased electric power
- 4% Generated electric power
- 3% Engine mechanical power
- 74% Steam mechanical power

Cracking plants—
- 41% Purchased electric power
- 1% Generated electric power
- 16% Engine mechanical power
- 42% Steam mechanical power

Complete plants—
- 42% Purchased electric power
- 20% Generated electric power
- 12% Engine mechanical power
- 26% Steam mechanical power

This shows that the complete refinery plants used more purchased power and also generated a greater part of their requirements than the other two groups. Another point noticed is that the amount of power supplied by internal combustion engines was a relatively small amount.

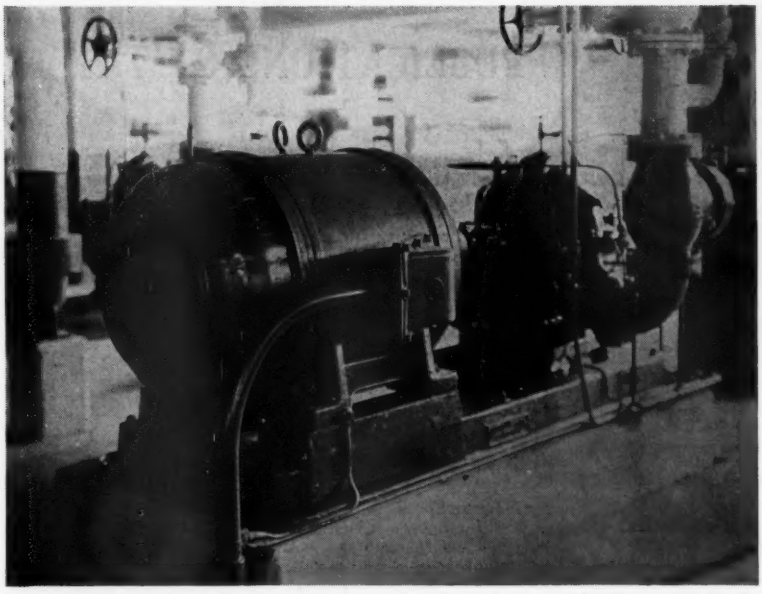
Further data of interest is to be found in the study of the uses of various types of fuels and to compare them on the basis of heat content. For the year 1935 the 422 operating refineries consumed various fuels as follows:

Still gas	43%
Oil	31%
Natural gas	14%
Coal	5%
Acid sludge	4%
Coke	1%
Purchased electric power	1%
Others	1%

We see from this that 48 per cent of the fuels used were refinery by-products, 31 per cent was oil and 21 per cent came from outside sources. It is significant to note that on a heat content basis the amount of purchased power is very small, whereas, the total of the oil and the refinery by-products, or 79 per cent, represents a supply of natural resources which is being consumed in a relatively inefficient manner, and through improved refining processes and practices could likely be turned to an attractive profit.

To the utility industry these figures indicate to a certain extent the potential market for purchased power in the refining industry. For the 44 plants studied, the average use of purchased electric energy was approximately 1½ kwhr per barrel of oil refined, whereas the average for all the 422 plants was only a little more than one kwhr per barrel. From this data it is seen that if all the plants were electrified only to the same extent as the 44, the result would be an increased annual usage of purchased power of approximately 400 million kwhr, represented by a demand on the utility systems of about 60,000 kilowatts.

In conclusion it can be said that in the petroleum refining industry there is a great outlet for purchased electric power and, likewise, the electric power industry provides a service which has many advantages and that the extended use of that service will certainly result in profits to the refining industry.



125 hp, 3600 rpm, 3 phase, 60 cycle, 2300 volts, dual-ventilated, explosion proof, type CS motor driving pump in a refinery

PUBLICATIONS OF THE INSTITUTE

Pub. No.		Date Issued	Price to Members	Price to Non-Members	Price to Foreign Countries
E1	Rectifier Wave Shape	(4/37)	$0.40	$1.00	$1.10
E2	The Electric Light and Power Industry in 1936	(1/37)	.30	.75	.85
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Plant Inventories

By J. H. Lobban
The Detroit Edison Company

A summary of a presentation made at National Accounting Conference, E.E.I., Detroit, Nov. 9, 1937

THE Federal Power Commission Classification does not require plant records or a plant inventory, but the schedule of retirement units which has been made a part of the Classification makes it necessary in practice to have property records. In addition, certain commissions have by order required such records, and undoubtedly other commissions will. The present trend is undoubtedly towards compulsory requirement of property records. As a matter of fact, had there been no new Classification the trend within the industry itself has been towards the keeping of more detail on plant records. We believe that the keeping of these records is good business and would probably pay for itself by the many uses made of them. I have tried to list some of these principal uses, which are as follows:

(a) As a historical record of plant.

(b) As a basis for insurance coverage and determination of losses.

(c) As a basis for tax assessments.

(d) As a basis for engineering and economic estimates of various sorts. Maintenance cost studies are made from time to time on the basis of property record detail by determination of existence of obsolete material, transformers to be rebuilt, age of poles, and so on.

(e) Used in rate studies. — it is impractical to set up automatic rate computations by accounts. At one time certain regulatory commissions of the country were determined to do this and actually arranged to break down operating expense accounts by classes of service. This, however, requires so many allocations and is so much of an estimate that it has no place in an accounting record. It might rather be done as a study at the time when the commission desires such figures.

(f) Used for statistical information for reports to officers, stockholders, and regulatory bodies.

(g) Used for write-offs.

(h) Used as a basis for depreciation studies.

(i) Used to facilitate certification of expenditures for bond issues.

(j) Used as a budget estimating guide.

(k) Affords ease and economy in reclassifications and reappraisals. In one appraisal made of our properties by outside engineers, both the time of doing the job and the expense were materially lessened due to the fact that we had an established property record. Photostatic copies of the record were taken into the field and checked, and with the voucher and work order references available, costs and pricing were also readily checked.

MR. LOBBAN

When one considers that the plant account is the largest item on a balance sheet and realizes that it cannot be audited by regular public auditors except for the year to year additions, it is reasonable to think that there should be adequate supporting records. Such records give the management assurance that the property shown on the books is actually in existence.

Scope of Field Inventory

It is essential that all unnecessary inventory expense be eliminated, and in order to do this all existing records, such work order cost records, maps of overhead and underground systems, transformer records, meter records, and other plant records should be examined to determine what property requires a complete field check and what can be inventoried in the office. If there is reason to believe that the overhead system maps are accurate and complete, they should then be spot checked to whatever extent is necessary to prove to the inventory supervisor that they can be used. Similarly with underground system maps, meter records, and transformer records. The use of these records will eliminate a tremendous amount of field work. Of course, all classes of plant which cannot be inventoried from the office will have to be inventoried in detail in the field.

Organization, Personnel, and Planning Inventory

The inventory organization should be in direct charge of one person, perhaps assisted by an advisory committee set up by the management. The work must have the backing of the management and the supervisor must have sufficient authority to obtain the whole-hearted cooperation of all departments. In using operating department's records, he must avoid conveying any impression that the property records will supplant the departmental records. Later on, the matter of what records shall be kept and where they shall be kept will work itself out after the property records are established. The inventory staff must include engineers, competent senior clerks familiar with the records, and field inventory men. It would be well to place men in charge of the inventories of steam generating plant equipment, hydro generating equipment, substation equipment, overhead system, underground system, and general equipment. Each step of the work should be planned and the analysis of costs from the office records should proceed with the inventory. Units for property record purposes should be established and the costs should be broken down to conform to these established units.

Detail to be Obtained on Inventory

The supervisor must determine in advance what items shall be inventoried and what lumped as miscellaneous, and in this connection the retirement units must be taken into consideration. In general, the inventory should include all identifiable items, and in listing these items the complete name plate description should be recorded. In this manner, sufficient detail will be obtained to permit the obtaining of prices from the manufacturer, if this should be required. It follows, therefore, that items which cannot be identified are the ones which should be lumped as miscellaneous. This

might include such items as nails, screws, small hardware, wiring supplies, wiring, cleats, tape, solder, small lugs, etc., not overlooking the supplies which are consumed in installation, such as gasoline, oil, waste, rags and the like.

Plant and Geographical Subdivisions to be Maintained

The Federal Power Commission Classification requires subdivision of plant accounts by generating stations and transmission lines. In addition to this, the records should be kept by accounts, of course, and by tax assessment districts and in such manner that the cost of a building and its contents may be drawn off for insurance purposes. If a rate-making district is different from a tax assessment district, then further detail should be kept. Such subdivision is not difficult, but it does lead to the keeping of a very voluminous record. The subdivision of overhead and underground systems extensions (additions to plant) and line transformers can be made, using the map records and construction foremen's sketches as a basis.

Work to be Done by Field Inventory Men Other Than Taking Inventory

We believe that the numbering of structures, items of equipment, furniture, and poles for identifying purposes is not necessary. In the early days of our property records, we started out to put identifying numbers on office furniture, but soon found that it was more work to number and keep track of these items than it was to reinventory periodically and determine where items of furniture which could not be found had disappeared to. The inventory and office men should attempt to obtain information required for historical pricing and the determination of original cost. This should include:

(a) The date of the original installation should be obtained from operating and accounting records and vouchers where possible, and if this is not possible, then the inventory men should question old employees.

(b) Old employees should also be questioned to determine whether there were any unusual construction difficulties which might have added to the original cost, such as quicksand encountered in constructing plant foundations.

(c) Where drawings of structures do not exist, the inventory men must make or have made rough scale drawings in order to have adequate records and in order to estimate costs, if costs are not available. In this connection, photographs may cut the expense and reduce the amount of detail necessary to show on such scale drawings. It may likewise be necessary to make scale layouts of piping, cable runs, and of concealed structures, such as intake or overflow canals.

(d) Although there is nothing in the Federal Power Commission Classification which indicates that an estimate of accrued depreciation will be required at the time of reclassification, if the accounting company, for its own information, wishes any figures on present value, the inventory men should estimate or obtain an estimate of the condition of the property at the time of the inventory.

Inventory Adjustments

This is merely to call your attention to the fact that percentages should be added to your inventories for omissions, wastage during construction, breakage, sag, theft during construction, and similar items. Don't forget in figuring the length of cable that they are trained around manholes, and that a certain footage is required to make cable joints, and don't overlook such items as tie wires and the making of allowances for items not inventoried.

Plant in Process of Installation or Removal at Date of Inventory

In making and preparing an inventory for setting up plant records, all inventories must be brought either forward or backward to a definite chopping off point. Inventories cannot be taken simultaneously throughout the system, and the daily work of adding line extensions and other construction jobs must go on. It is well to consider this in advance and very carefully, or errors will be introduced. The inventory supervisor must be informed on what new installations or removals are contemplated and when the work is to be done. He must keep constantly in touch with departmental orders and so arrange his field work that he will inventory either ahead or behind the construction men. Work orders should be marked so that the inventory men will known whether to add or subtract from the inventory to bring the inventories to a set date. This means a complete coordination of the work in the office and in the field, and it is very important that this coordination be planned in advance.

GERTRUDE VS. PURCHASED POWER

Gertrude plays the chimes in Phil Spitalny's band on General Electric's radio program—and recently did a little research in her sponsor's business. It wasn't as much fun as it seems to be here.

Having heard a lot of loose talk about the high cost of electricity, she went for a bicycle ride. The bicycle didn't move because it wasn't touching the floor—and the rear wheel was connected to an electric generator. As she pedalled, the amount of energy she produced was recorded on the panel at the rear. Gertrude tired after a few minutes—and was told that if she had ridden at top speed all day she would have generated perhaps five cents' worth of electric current—perhaps even less.

That gave her a rough idea of how much energy a nickel buys in human terms. *So Gertrude is staying with the band, where the pay is higher.*

Preservation and Destruction of Records

By Emil Ulbricht
Public Service Electric & Gas Company

Presented at National Accounting Conference, E.E.I., Detroit, Nov. 8, 1937

THE SUBJECT, Preservation and Destruction of Records, is limited to the "lack of detailed instructions providing for continuous follow-up in destruction of obsolete records resulting in their increasing cost of storage in operating companies."

The subject has many ramifications, the presentation of which would require more time than that allotted for this paper. Its importance cannot be stressed too strongly.

It is not a new subject. At the 1923 Convention of the National Electric Light Association, the Preservation of Records Committee presented an excellent paper, a comprehensive report concerning not only the preservation of records, but also the destruction. The idea was advanced that records will accumulate to such an extent as to eventually become a source of great expense. It sought then, that for the purpose of the immediate future some definite plan should be promulgated to avoid needless expense because of the ever increasing quantity of records which would require storage space. It recognized that each succeeding year would find an accumulation of closed or inactive records, whose useful life had ceased, and the need for a rule for the destruction of such records.

It, therefore, recommended a rule, based on the "Regulations to govern the destruction of records of telephone, telegraph and cable companies, Issue of 1920" prescribed by the Interstate Commerce Commission, making only such additions and corrections so as to be applicable to electric light and power companies. No State up to that time had issued any rule in such detail as had the Interstate Commerce Commission. In fact, very few States had given the matter any consideration, the few covering it in very general terms only.

In our Company we have had a rule since 1920, one of our own development and not regulated or supervised by the State commission. Several revisions have been made, not in principle, but because of the adoption of new forms, or the discontinuance of old forms. The retention of the records, either permanently or for periods longer than might be necessary, has also become a problem because of the increasing quantity of such records,

MR. ULBRICHT

In its present state the subject is not one of a controversial nature, but as utilities grow and become older it is likely to command the attention of all executives in its significance as the requirement for the permanent retention of records, if not properly handled, becomes an increasingly important factor. The storage of records, from the beginning, has been governed more or less by the policy of each utility, although in some States the matter has been subject to the rules and regulations of the regulatory bodies.

The storage of records has become one of current importance by virtue of the authority granted to the Federal Power Commission under the Federal Water Power Act section of the Public Utility Act of 1935. Under Section 301 (a), every licensee and public utility shall make, keep, and preserve for such periods, such accounts, records of cost-accounting procedures, correspondence, memoranda, papers, books, and other records as the Commission may by rules and regulations prescribe as necessary or appropriate for purposes of the administration of this act, including accounts, records, and memoranda of the generation, transmission, distribution, delivery, or sale of electric energy, the furnishing of services or facilities in connection therewith, and receipts and expenditures with respect to any of the foregoing: *provided,* however, That nothing in this Act shall relieve any public utility from keeping any accounts, memoranda, or records which such public utility may be required to keep by or under authority of the laws of any State.

The Federal Power Commission, therefore, in its system of Accounts, approved June 16, 1936, which became effective January 1, 1937, incorporated the following text under General Instructions, relative to Records:

"2C. No utility shall destroy any books or records which support entries to its accounts unless the destruction thereof is permitted by rules and regulations of the Commission. Until rules and regulations have been issued by the Commission, each utility may continue its existing practice with respect to the retention or destruction of records. Each utility, however, shall file with the Commission within 60 days after the effective date of this system of accounts a statement of its existing practice with reference to the destruction or other disposition of records; the Commission reserves the right to require the utility to make any change in its practice which is deemed necessary for the preservation of adequate information."

Each utility, in the spring of this year, was requested by the Federal Power Commission to submit its procedure, following which the Commission prepared, under date of May 5, 1937, the first preliminary draft of "Rules Governing the Preservation of Records of Public Utilities and Licensees," which was sent to utilities with a request for comments, suggestions and criticisms. The draft was considered by the Accounting Committee of the Edison Electric Institute at the Chicago Convention last June. After a brief discussion, Mr. G. H. Bourne, Comptroller of the Commonwealth and Southern Corporation, agreed to compile the comments, suggestions, and criticisms sent to him by different

companies, for transmission to Mr. C. W. Smith, Chief, Bureau of Finance and Accounts, of the Federal Power Commission.

Let us for a moment review the first draft of the rule as it was submitted to the utilities, particularly the items required to be retained permanently. Has any one had to produce in the courts, or before any regulatory commission, or do you think it will ever be necessary, certain records which the Federal Power Commission will require to be retained permanently. Of course, some of them of current years might be necessary. Take for instance—Capital Stock and Bond Subscription Accounts; trial balance sheets; supporting papers and other records, although the rule will permit destruction of payroll and time records, material issue sheet, etc.; summaries of distribution of charges through vouchers; records of self-insurance against losses from fire, etc.; tax bills and receipts; maps, diagrams, profiles, plans, etc.; summaries of monthly operating revenues according to classes of service; freight bills on materials and supplies, etc.; credit memoranda of materials and supplies, etc.; general inventories of materials and supplies; and index of forms used by the company, etc. Then, because certain records affect construction, the Commission will require permanent retention of all the following records, regardless of the fact that some may represent charges to revenue, operating or clearing accounts, such as paid and cancelled vouchers, original bills, and invoices for materials and supplies, etc.

I could refer to more records of like character which the Federal Power Commission will require to be retained permanently or for periods longer than justifiable. I believe I have selected enough to develop the need, if the Commission's rule is issued as originally drafted, for some thought being given to the expense incident to the storage of records.

I stated at the beginning that the matter is not controversial, and by that I meant it is not debatable. It is with us now, and it will be with us in the future. It isn't a question of each company destroying its records as it sees fit, as in the past, but of following the plan for the preservation and destruction as prescribed by the rules and regulations of the Federal Power Commission, and later to be prescribed by the several State Commissions.

Therefore, the question that confronts you and me, and every utility representative, is the expense of storing the ever increasing number of so-called inactive records, either permanently or for periods longer than reasonably necessary. Is there some method that can be adopted to avoid the tremendous cost that will be entailed as a result of the rules and regulations of the Federal Power Commission, and yet retain the records? Not exactly—but a facsimile of the records can be made, and considerably less storage facilities required, with a consequent decrease in cost.

What is the method? It is not new, because it has been successfully tried, not only in the utility business, but in other industries. I refer to Recordak, a process for filming records sponsored by the Recordak Corporation, a subsidiary of Eastman Kodak Company. A very interesting article on the "Storage and Protection of Company Records," written by Mr. D. E. Maloney of the East Ohio Gas Company, Cleveland, Ohio, appeared in the May, 1936, issue of the *American Gas Association Monthly*.

The Recordak takes pictures of business documents at high speed on narrow width motion picture film. It is practically automatic in operation. To photograph papers the operator only has to feed them, one at a time, into the feeding hopper of the machine, much as a mimeograph or multigraph is fed. The Recordak automatically photographs the papers and ejects them in original order. Documents can be photographed by the machine as rapidly as the operator can feed them into it.

The speed with which documents can be photographed is unusual. Banks using the machine to photograph their checks attain picturing speeds of 100 checks per minute. Department stores that use the equipment in their accounting routine for the photographing of customers' statements, obtain photographing speeds of from 70 to 80 customers' statements per minute. Letter size documents are photographed at a speed of 60 to 70 per minute.

Various sized documents can be photographed without any manipulation to the photographing equipment. A bank check, a 5″ x 8″ card, a letter size document, and a legal size document can all be fed through the machine, one after the other, without the operator changing the machine set-up in any way. The machine automatically takes care of the different length of the documents, shutting off the film supply when no document is in a photographing position. Consequently, no film can be wasted.

The Underwriters Laboratory rates the film as the equivalent of filed papers from the standpoint of fire hazard, and since the film record of documents occupies less than 1/100 of the space occupied by the original documents, the fire hazard is in reality reduced in this proportion.

The film record is easily referred to in special reading projectors which have been developed for this purpose. These projectors enlarge the film pictures back to the size of the original documents, and in some cases above the original size, facilitating the reading of the material. The boxes in which the film is returned to users after being developed can be marked to indicate the contents of the roll, just as file drawers are labeled.

Records which must be retained for long periods of time present an ever-increasing problem, and result in an ever-increasing cost. Photographing these inactive records on film is advantageous in several ways. First, since the film record occupies a very small fraction of the space occupied by the original materials, there is an enormous saving in the space required to retain the materials. Second, the cost of filing equipment required to house the materials is practically eliminated, one file cabinet of film replacing many cabinets of the original material. The labor of maintaining the files is also considerably reduced. Third, since the materials in film form occupy so little space, they can be retained in the department using them, eliminating the necessity of having to get them from storage warehouses for reference. Fourth, once photographed on film, individual documents are bound in their proper sequence. It is impossible to misplace or misfile individual papers, resulting in either permanent or temporary loss.

Naturally, in considering the film method for retention of your inactive records, there is one consideration that stands out above all others—will it save you money? Record storage costs vary considerably between companies, but once these are accurately determined, comparing them with the photographing costs will indicate the savings that can be made.

You will be interested in knowing that the Canadian government was among the first to use Recordak for the storage of inactive records. Their record vaults

(*Continued on page* 31)

The Value of a Customer History Record

By K. E. Boyle
The Dayton Power and Light Company

Presented at National Accounting Conference, E.E.I., Detroit, Nov. 10, 1937

IN the discussion of this subject let us consider it under two general headings, first—What is a Customer History Record, and second—Some Benefits that can Reasonably be Expected from such a Record.

What Is a Customer History Record?

It is my personal opinion that basically it is a record of a utility's credit experience—paying habits if you please—with its customers. However, if this were the only information carried on the record its use would be confined almost solely to authorizing credit and should then more properly be termed a Credit Authorization Record. But the experience of many companies who started with only a credit authorization record has been that they soon found there were numerous other records being separately maintained, the customer information contained in which was of material value not only in intelligently authorizing customer credit but in various other work involving customer contact. Particularly was this true if the information which these other records carried could be quickly and readily referred to. It was only natural, therefore, that one record should be developed which would combine and centralize in one place all the customer information carried on a number of separate and individual records. This development has been most aptly termed a Customer History Record and may include all or any combination of the following records:

1. Permanent Service Applications or Contracts.
2. The Security or Customer Deposit Record.
3. Record of Accounts Guaranteed and Guarantor Agreements.
4. Record of Delinquent Inactive or Suspense Accounts.
5. Record of Accounts Charged Off as Uncollectible.
6. Record of Repossessed Appliances.
7. Record of Customers whose Service was Disconnected for Non-Payment of Bills.
8. Record of Bad Checks Received.
9. Continuous and Up-to-date Record of Collection Effort made either by mail or personal call.
10. Record of Customers Interfering with or By-passing Service.
11. Record of Discounts or Penalties Allowed.
12. Miscellaneous Information valuable in Determining Customers' Credit Status.

To what extent individual companies who have a Customer History Record have found it practical to combine into this one record all of those above mentioned, as well as others which may be more or less peculiar to their own operations, depends to a large extent upon the office routines and procedures followed, the relative importance or value attached to each type of record and the volume carried or handled.

For example, if the management definitely has decided that it shall be the policy of a company to be extremely lenient with respect to the allowance of customer discounts or penalties without regard to the number of such allowances which any one customer may or should receive in a given period of time, then it would seem obvious that to include in the Customer History Record a continuous and up-to-date record of such items would not only be costly, because of the probable volume, but an expense which would not be justified in terms of "use value," for, although the information was available, it would serve no particular purpose in view of the company policy which was in effect. On the other hand, if it is company policy to be very strict with respect to such allowances then, I believe, such information could economically be included as a part of the Customer History Record.

To further illustrate my point let me take the case of a company that has some 200,000 customers who are to be covered by such a record and is carrying only 2000 delinquent inactive accounts, an average of one in every one hundred cards in the file. Because of this large ratio of Customer History Cards to delinquent inactive accounts and in view of the fact that undoubtedly a trial balance of such items must be taken once each month it might be much more efficient and practical to carry the authentic accounts receivable record of such items separately. Therefore, it will be readily appreciated that careful study and consideration should be given all records in light of their use, importance, volume, etc., in the individual company before a final decision is reached as to which shall be included in the customer history record and which shall not.

The physical make-up of a Customer History Record consists of a card for each customer, so designed as to provide the necessary space to carry the various kinds of information desired, filed in phonetic or Soundex order in visible equipment and usually housed in some type of fireproof or fire protected equipment.

Filing the cards in phonetic or Soundex order has very distinct advantages over a strictly alphabetical arrangement. By use of the former arrangement similar sounding names, regardless of variations in spelling, are automatically grouped together. For example, the cards for a customer who came in on one occasion and signed for service in the name of Scheckwitz and at some later date in the name of Sheickwits would be filed side by side assuming the customer used the same given name in both cases. And experience has shown that seldom is the customer prone to change his given name. For this reason most companies having a Customer History Record ask for the given name and the middle initial of the customer as well as the given name of the husband or wife.

Some Benefits That Can Reasonably Be Expected From Such a Record

It facilitates intelligent credit authorization since all items affecting a customer's credit standing are centralized on one record and can be made available with a minimum of delay to the employee contacting the customer. Thus the customer can be told at the time he is in the office or on the telephone what will be required as security, what arrangements must be made for the payment of old or past due accounts, etc., before he can expect to have service made available.

The ability to make definite arrangements with the customer at the time he first requests service is much more desirable than extending service on a provisional or courtesy basis with possible subsequent follow-up which carries with it a definite labor cost and on many occasions may prove both embarrassing and expensive from a Public Relations standpoint.

Including the permanent application

feature as part of the record eliminates much customer ill will and annoyance due to the fact that once the customer's signature has been obtained it serves for any location to which he may move, whether it be only across the street or to an entirely different section of the city. From a company operation standpoint this feature results in a very definite labor saving for filing, typing, transcribing, etc.

Most customers appreciate being treated on an individual or personalized basis. It is felt a Customer History Record enables those companies having one to do this quickly, accurately and with a minimum of discrimination yet taking cognizance of special conditions peculiar to the individual customer.

The record makes available to the customer contact man in the beginning, or the Collection Department later, when dealing with the individual customer definite and accurate facts regarding his account during that period of time he has been using service. These give confidence to the company employee in talking to the customer and materially decrease the possibility of his becoming involved in lengthy arguments, because as soon as the customer realizes that the company has an accurate record of the facts covering his case he is generally willing to meet the requests made.

Since there is carried a complete and continuous record of collection experience for each customer, collection effort readily can be directed to those accounts where it is most needed, eliminating the accounts on which the effort is largely wasted. Thus it should materially help to keep items of collection expense, such as supplies, labor and postage in connection with delinquent notices, labor and transportation cost of outside collectors, bad debt losses, interest paid on security deposits, etc., to a minimum.

While the above are not intended as a complete list of the benefits that can and have been derived from a Customer History Record it is felt they are representative of those most quickly brought to attention after the installation is made. Some may argue that all this information can be obtained and made available without the expenditure required for a Customer History Installation. Admittedly such argument may be true, but if such is the case then the information must be made available through the maintenance of separate or individual records with their attendant cost of upkeep; whereas

(*Continued on page* 32)

SALES—ELECTRIC REFRIGERATORS

(Household Models Only)

MONTH OF NOVEMBER AND FIRST ELEVEN MONTHS OF 1937-1936

	Month of November 1937	Month of November 1936	Month of October 1937	First Eleven Months 1937	First Eleven Months 1936
Total United States	89,739	78,265	67,857	2,259,483	1,956,327
Maine	641	24	261	8,868	7,045
New Hampshire	545	75	177	7,082	6,259
Vermont	403	46	199	5,724	4,369
Massachusetts	5,856	2,229	2,534	92,892	75,053
Rhode Island	1,330	441	52	12,658	9,743
Connecticut	2,254	1,148	786	40,575	33,183
Total New England	11,029	3,963	4,009	167,799	135,652
New York	11,966	11,057	11,854	268,142	230,514
New Jersey	4,009	3,987	2,743	90,524	83,940
Pennsylvania	8,584	5,765	4,804	218,793	179,084
Total Middle Atlantic	24,559	20,809	19,401	577,459	493,538
Ohio	7,079	5,188	2,979	164,119	128,139
Indiana	1,279	2,290	1,926	62,666	55,227
Illinois	6,124	7,411	7,130	176,019	145,000
Michigan	4,544	5,202	5,665	121,958	97,266
Wisconsin	2,215	1,392	2,889	49,128	32,648
Total East No. Central	21,241	21,483	20,589	573,890	458,280
Minnesota	2,003	1,741	1,712	41,654	27,805
Iowa	1,010	929	853	33,437	29,553
Missouri	1,652	2,570	931	63,555	61,578
North Dakota	197	270	336	4,120	3,185
South Dakota	154	140	116	4,624	4,958
Nebraska	694	921	395	16,401	17,134
Kansas	877	1,067	304	24,186	23,102
Total West No. Central	6,587	7,638	4,647	187,977	167,315
Delaware	458	84	159	5,463	3,744
Maryland	803	360	785	27,944	20,959
District of Columbia	592	374	1,038	18,648	18,558
Virginia	980	1,040	1,213	34,870	30,627
West Virginia	659	537	277	25,990	23,799
North Carolina	732	1,019	643	45,552	36,580
South Carolina	441	421	439	22,127	17,758
Georgia	833	2,127	1,473	38,601	33,262
Florida	1,403	2,160	2,894	29,565	29,260
Total South Atlantic	6,901	8,122	8,921	248,760	214,547
Kentucky	1,207	776	183	29,509	25,818
Tennessee	559	867	540	34,981	29,781
Alabama	940	600	472	24,794	21,746
Mississippi	221	123	33	11,161	10,867
Total East So. Central	2,927	2,366	1,228	100,445	88,212
Arkansas	464	360	252	12,396	11,298
Louisiana	517	324	404	22,795	19,660
Oklahoma	984	691	147	22,377	19,456
Texas	2,809	2,340	2,454	89,099	78,941
Total West So. Central	4,774	3,715	3,257	146,667	129,355
Montana	273	189	201	8,552	8,953
Idaho	299	225	133	9,303	9,197
Wyoming	87	80	25	3,016	2,920
Colorado	373	957	227	14,384	14,688
New Mexico	98	73	209	4,644	3,756
Arizona	355	53	257	7,870	5,938
Utah	385	151	98	11,824	11,333
Nevada	175	92	141	2,683	2,852
Total Mountain	2,045	1,820	1,291	62,276	59,637
Washington	831	1,785	361	32,298	32,844
Oregon	619	1,377	425	17,146	20,944
California	8,226	5,187	3,728	144,766	156,003
Total Pacific	9,676	8,349	4,514	194,210	209,791

Figures based on report by the NEMA on Net Sales to Dealers and Jobbers.

More Than One Hundred Companies Now Using Reddy Kilowatt

Companies using the Reddy Kilowatt program have now passed the hundred mark. More than forty companies adopted the program in 1937, more than equaling the number contracting for Reddy's service in the preceding two years, according to Ash Collins, originator. As a good start for the New Year, a dozen or more companies begin the use in January of the services of this now universally known figure in his humanizing and popularizing capacities.

Companies operating in nearly all the states and Hawaii and in six foreign countries are now using Reddy to further their advertising, sales and public relations activities.

As of January, 1938, the following companies are launching this dynamic character:

Minnesota Power & Light Company, Duluth, Minn.
Hawaiian Electric Company, Honolulu, Hawaii
Gulf States Utilities Company, Beaumont, Texas
Arizona Edison Company, Inc., Douglas, Ariz.
Superior Water, Light & Power Co., Superior, Wis.
West Penn Power Company, Pittsburgh, Penn.
Compania de Electridad del Sud Argentino, S.A.
Cia. Central Argentina de Electricidad, S.A.
Cia. de Electricidad de Los Andes, S.A.
Cia. de Electricidad del Norte Argentino, S.A.
Cia. de Luz y Fuerza Motriz de Cordoba, S.A.
Cia. Hidro Electrica de Tucuman, S.A.
Cia. de Electricidad del Este Argentino, S.A.
S.A. de Electricidad de Alta Gracia

Meeting of the Joint Subcommittee on Development and Research

THE Joint Subcommittee on Development and Research met with its project committees on Nov. 18, in New York, with Mr. Warren presiding. The various project committees presented progress reports covering the work for the last six months.

In addition to the progress reports three technical reports were presented.

Project Committee 1A—Noise Induction presented for the information of the committee a summary of the results contained in a report on the inductive coordination of rural power and telephone systems, on which it is working. The project committee stated that it expected to complete this report in the near future.

Project Committee 1B—Noise Evaluation presented a report entitled "Instruments for Measurement of Telephone Circuit Noise and the Telephone Influence Factor of Power System Wave Shapes." This report contains descriptions of visual indicating instruments developed for the purpose of measuring telephone circuit noise and the telephone influence factors of power system voltage and current waves. The instruments embody the principles set forth in Engineering Reports Nos. 32 and 33, "Relative Interfering Effects of Single Frequency Noises in Telephone Circuits," and "The Telephone Influnce Factor of Supply System Voltages and Currents." A brief review of the principles involved in visual noise measurements is given. In addition to describing the instruments, an explanation is given of the manner in which the instruments are intended to be used and of the quantities which are measured.

Project Committee 2A—Hazard and Protection presented a report entitled "Higher Voltage Joint Use Near Roanoke, Va." This report is one of a series of reports dealing with studies of specific situations involving joint use at the higher distribution voltages. The general results of this series of studies has been incorporated in Provisional Report 19, entitled "Joint Use of Poles—Telephone Circuits and 6.6 and 13.2 kv Power Circuits—Safety Features," which was issued early this year.

Project Committee 2J — Control of Residuals presented a report entitled "Distribution Circuit Ground Relaying Study — Oscillographic Observations." This is an interim report, to make available the results up to Jan. 1, 1937, of a field study of distribution circuit fault characteristics and protective device performance, obtained from feeders of seven distribution systems operating at voltages ranging from 4 kv to 13 kv. Attention is devoted primarily to the performance of fuses and of circuit breakers and associated relays. The data have been analyzed also to show the frequency of occurrence, cause, magnitude, and duration of the faults.

The report of Project Committee 2J was recommended for issuance as a provisional report. Announcement will be made in the BULLETIN when this recommendation is acted upon by the Joint Committee on Plant Coordination.

Preservation and Destruction of Records

(*Continued from page* 28)

were filled with cancelled government bonds which had to be retained, and they faced the necessity of building additional vaults for these. However, instead of doing this, they used Recordak to photograph these bonds, the film record being retained, rather than the bonds. In this way they greatly reduced their storage costs for these bonds.

I do not know whether the Federal Power Commission or any State Commission will accept this method as a substitute for the original records. I am reliably informed, however, that a similar method, the photostatic copy of original documents has in many instances been admitted as evidence in court proceedings, although opposing counsel might be upheld in his objection to its admission. The Recordak film has in some cases served as evidence in lieu of the original records, and in a recent criminal case in Newark, New Jersey, was successful in sending to prison a clerk accused of forging his employer's signature. It was his practice to destroy the paid check when returned by the bank, claiming an erroneous charge on the statement. The practice was uncovered when the bank adopted the Recordak equipment.

Now, I submit to this conference the use of Recordak film, or some other similar method, as a cost-saving substitute, and recommend that a further study be made by a committee to be appointed by the Chairman. It is a matter worthy of further consideration by the industry.

Electrical Equipment Committee Meeting

THE winter meeting of the Electrical Equipment Committee will be held at the Netherland-Plaza Hotel, Cincinnati, Ohio, on February 7 and 8.

The Monday morning session will be open only to representatives of member companies and at this session there will be discussions relating to apparatus trouble, system failure, and oil fires, by various members of the committee.

Among the more interesting presentations for the open session of Monday afternoon and Tuesday morning are reports on station design and modernization, power supply for electric welders, generating system capacity reserve requirements, discussion of continuing property records, and a paper describing the automatic Serra hydroelectric development near Santos, Brazil. Representatives of member companies of the Institute are, of course, welcome at all sessions of the committee meeting.

The Value of a Customer History Record

(*Continued from page* 30)

with the installation of a Customer History Record the information carried on these various individual records, a large part of which after careful analysis is often found to be duplication, can be condensed and centralized into one, thus very definitely reducing the over-all cost of compiling and keeping such information, yet making it more accurate and more readily available for use at all times.

From experience most companies that have installed such a record have found the results obtained to be highly satisfactory and in view of the benefits derived the cost of operation comparatively inexpensive. A number have found it possible to identify and recover, during the installation alone, amounts previously charged off but due from customers still using service at some other location, which, in the aggregate, covered all or at least a substantial part of the initial cost of the installation.

In conclusion, therefore, it might well be stated that undoubtedly there are some individual cases where the installation of a Customer History Record would not be the proper solution to certain Credit, Public Relations and Collection problems, but any company not having such a record yet desiring to improve its Public Relations through better Customer Contact; desiring to reduce collection expense through the consolidation of records, the elimination of costly routines, the concentration of collection effort where it will be most effective and the reduction of bad debt losses; and desiring to speed up and improve the quality of its credit authorizations, can ill afford not to thoroughly investigate the merits of such a record as applicable to its particular problems.

CONVENTIONS AND MEETINGS

FEBRUARY

1 Canadian Electrical Association, annual winter conference, Montreal, Can.
6-7 Prime Movers Committee, EEI, Netherland-Plaza Hotel, Cincinnati, Ohio.
7-8 Electrical Equipment Committee, EEI, Netherland-Plaza Hotel, Cincinnati, Ohio.
7-12 National Electrical Manufacturers Association, New York, N. Y.
9-10 Transmission and Distribution Committee, EEI, Brown Hotel, Louisville, Ky.

MARCH

28-31 Sales Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.

APRIL

20-22 Missouri Association of Public Utilities, Jefferson Hotel, St. Louis, Mo.
20-30 National Electrical and Radio Exposition, New York, N. Y.

MAY

2-5 Chamber of Commerce of the U. S. A., Washington, D. C.
2-5 Engineering Committees, Edison Electric Institute, Edgewater Beach Hotel, Chicago, Ill.
9-13 National Fire Protection Association, Atlantic City, N. J.
22-26 National Electrical Wholesalers Association, Hot Springs, Va.

JUNE

7-9 *EDISON ELECTRIC INSTITUTE, Atlantic City Auditorium, Atlantic City, N. J.
20-24 American Institute of Electrical Engineers, Washington, D. C.
20-24 American Society of Mechanical Engineers, St. Louis, Mo.
22-24 Canadian Electrical Association, annual convention, Seigniory Club, Province of Quebec, Canada.

*EEI CONVENTION

The 1938 Convention of the Edison Electric Institute will be held in the Auditorium, Atlantic City, N. J., June 7, 8 and 9. All business sessions will be held in the Grand Ballroom. Monday, June 6th will be left free for Committee meetings.

Business sessions will be held on Tuesday morning and afternoon, June 7; Wednesday morning, June 8 and Thursday morning, June 9.

The President's reception will be held at the Hotel Traymore on Monday evening, at 9:30 p.m. The banquet will be held on Wednesday evening at the Hotel Traymore at 7:30 p.m.

Special entertainment for the ladies will be provided for Tuesday afternoon, and announcements will be made later regarding this affair.

The Convention Hotel and Transportation Circular will be issued at an early date, and all those planning to attend the 1938 convention are requested to make their reservations direct with the hotel of their choice.